Butte County Pre-Disaster Mitigation Plan

December 2010

Butte County Office of Emergency Management

The Butte County Pre-Disaster Mitigation Plan was developed to meet the requirements of the Disaster Mitigation Act of 2000 for the political subdivisions of the City of Belle Fourche, the City of Newell, Town of Nisland (including Fruitdale and Arpan), Vale Township, Union Township (including Castle Rock and Hoover), and Butte County. The original plan was written and approved in 2004. This is an update to the original plan. The purpose of the Pre-Disaster Mitigation Plan is to provide strategies and enumerate potential projects for mitigating or reducing the loss of life and property in the event of an emergency or disaster within the confines of Butte County and its political subdivisions.

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INTRODUCTION

Hazard Mitigation: Any action taken to reduce or eliminate the long-term risk to human life and property from hazards. The term is sometimes used in a stricter sense to mean cost-effective measures to reduce the potential for damage to a facility or facilities from a disaster event (FEMA definition).

Mitigation: Measures taken to reduce the harmful effects of a disaster by attempting to limit the disaster's impact on human health and economic infrastructure

Mitigating effects of potential disasters is not a new concept in Butte County. Even before written mitigation plans were required, projects and programs were implemented by the County and its political jurisdictions to prevent loss of life and damage to property from disasters. This included building organizations and management structures to improve recovery from catastrophic events and reduce their impacts on local residents. The County's first Pre-Disaster Mitigation Plan was written in 2004. This plan picks up where previous mitigation efforts and mitigation plans have left off and identifies the direction mitigation efforts can be pursued in the future. This plan can be compared to reading a road map with a general destination in mind and how the road map shows more than one route that can be taken to arrive there.

In several cases, there are existing County plans for dealing with specific catastrophic events, most notably wildfire and dam failure. The findings, recommendations, and projects included in these plans have been summarized and included in this plan. This does not eliminate the requirement to review and update those individual plans, but including specific information from them in this effort helps to provide a more comprehensive view of all hazards and aids in prioritizing mitigation projects according to their probability of occurrence.

It should be emphasized that this plan deals almost exclusively with natural hazards and mitigating their impact on Butte County. However, certain man-caused events are listed and described herein. There are some recommendations for mitigating (preventing or preparing for) such events. However, the primary focus of mitigation strategies, objectives and projects is on natural hazards.

Finally, as previously noted this plan is not the only way nor are the projects recommended the only projects that will reduce the impacts of specific hazards. The plan is a general guide for the various jurisdictions to use in selecting and implementing measures to achieve the overarching objective of reducing the harmful effects of a disaster on residents.

Summary of Changes: The following list is a summary of major changes to the Butte County Pre-Disaster Mitigation Plan and its development process.

- The development process used a metrically based analysis of hazard probability, the impact of events on critical infrastructure, and in assessing risk and vulnerability.
- All sections of the previous plan were reviewed and edited. New and updated information was incorporated.
    - Information on event profiles, and vulnerability and exposure were added.
    - Man-caused events were studied and information included.
    - Appendices were added.
- A more complete list of critical assets and resources was developed and included locally critical private resources and at risk people and property.
- The use of FIRM data for assessing flood vulnerability and potential damage areas.
- Review of flood damage claim data which followed major flood events.
- Inclusion of man-caused hazards in the plan.

This plan has been approved by the governing bodies of Butte County, the City of Belle Fourche, the City of Newell, Town of Nisland, and Vale Township.

Your comments and suggestions are encouraged. Contact the Butte County Emergency Manager:

Butte County Emergency Management
839 5th Avenue
Belle Fourche, South Dakota 57717
(605) 723-0900

I. PLAN DEVELOPMENT

Planning Partners

The following organizations, agencies and concerns provided data or assisted in the development of this plan:

Federal Emergency Management Agency (FEMA)
US Army Corps of Engineers
US Geological Survey (USGS)
US Environmental Protection Agency (EPA)
National Weather Service (NWS)
National Interagency Coordination Center (NICC)
US Bureau of Reclamation (BOR)
US Census Bureau
US Department of Agriculture
Natural Resources Conservation Service (NRCS)
SD Office of Emergency Management (OEM)
SD Governor's Office of Economic Development
SD Department of Environment and Natural Resources
SD Department of Agriculture
SD Department of Game, Fish and Parks (GF&P)
Butte County Emergency Management
Butte County Assessor's Office
Butte County Auditors Office
Butte County Department of Transportation (DOT)
Butte County Local Emergency Planning Committee (LEPC)
City of Belle Fourche
City of Newell
Town of Nisland
Town of Fruitdale
Vale Township
Union Township
Black Hills Power Company
Butte Electric Cooperative
West River Cooperative Telephone Company
Montana-Dakota Utilities Company
DM&E Railroad
Butte-Meade Sanitary Water District
Belle Fourche Irrigation District
Belle Fourche River Watershed Partnership
Belle Fourche Chamber of Commerce

Statutory Requirements

The Disaster Mitigation Act of 2000, Section 322, requires local governments have a mitigation plan in place as a condition for receiving federal disaster mitigation funds.

The Act has two base requirements for receipt of increased Federal share for hazard mitigation measures. Each mitigation plan developed by local government shall:

- Describe actions to mitigate hazards, risks, and vulnerabilities identified under the plan.
- Establish a strategy to implement those actions.

These two requirements contained in the Federal Register 44CFR, Part 201, include some very specific actions that must be met to comply with the Disaster Mitigation Act of 2000.

- After November 1, 2004 local governments must have a plan approved by the State and Federal government to qualify for Pre-disaster Mitigation planning grants.
- After November 1, 2004, local plans must be approved to qualify for the disaster related Hazard Mitigation Grant Program.

Purpose

The Butte County Pre-Disaster Mitigation Plan was developed to meet the requirements of the Disaster Mitigation Act of 2000 for the political subdivisions of the City of Belle Fourche, the City of Newell, Town of Nisland (including Fruitdale and Arpan), Vale Township, Union Township (including Castle Rock and Hoover), and Butte County. The original plan was written and approved in 2004. This is an update to the original plan. The purpose of the Pre-Disaster Mitigation Plan is to provide strategies and enumerate potential projects for mitigating or reducing the loss of life and property in the event of an emergency or disaster within the confines of Butte County and its political subdivisions.

Objectives

- Update the existing Butte County Pre-Disaster Mitigation Plan to provide structure for present and future emergency planning, preparedness, response, recovery and mitigation efforts.
- Involve residents, businesses and government officials in the planning process.
- Identify hazards that are most likely to occur and which pose the greatest threat to the people, infrastructure, and economy in Butte County.
- Identify those persons or property at risk in Butte County.
- Develop mitigation strategies for identified hazards to reduce the impact and risks to people and property in Butte County.
- Provide a Pre-Disaster Mitigation Plan for the following jurisdictions:
  City of Belle Fourche

City of Newell
Town of Nisland (including Fruitdale)
Vale Township
Butte County

- Identify emergency preparedness education needs for residents of Butte County.
- Identify hazards which can be mitigated through public education, emergency planning, and locally funded projects.
- Identify hazards that will require expenditures of funds not currently available through local government funding mechanisms to mitigate.

References

Federal

Public Law 920; Federal Civil Defense Act of 1959; as amended
Public Law 93-288; Disaster Relief Act of 1974; (Stafford Act) as amended
Federal Response Plan 9230 -1PL
Title III, Superfund Amendments and Re-authorization Act of 1986
National Flood Insurance Program of 1968 (NFIP)
National Environmental Policy Act of 1968
National Flood Insurance Reform Act of 1994 (NFIRA)
Disaster Mitigation Act of 2000

State

South Dakota Codified Law (SDCL)

1-24; Joint Exercise of Governmental Powers
33-15; Emergency Management
33-15-3; Coordination with Federal Government
33-15-25; Authority to accept Federal moneys, services or equipment
33-15-26; County emergency management organizations
33-15-27; Director of local organization-Duties and Powers
33-15-29; Contracting Powers of Local Subdivision

Local

Butte County Administrative Plan
Butte County Local Emergency Operation Plan
Butte County Community Wildfire Protection Plan
Orman Dam Evacuation Plan

II. PLANNING PROCESS

Methodology

The Butte County Board of County Commissioners authorized the update of the Pre-Disaster Mitigation Plan for Butte County and tasked the Butte County Office of Emergency with the responsibility. Fred Wells was selected by the County Emergency Manager and approved by the Commission to supervise the update process.

A meeting was held on 18 December 2008 with emergency services personnel, City and County government officials, and commercial utilities representatives to discuss issues which arose during recovery from the November 2008 severe winter storm and blizzard. This meeting was used to introduce the Butte County Pre-Disaster Mitigation (PDM) Planning project and discuss the process for updating the County plan. The Butte County Local Emergency Planning Committee (LEPC) was designated the focal point for the planning effort.

The planning process generally followed the processes and techniques published by the Federal Emergency Management Agency (FEMA) in their *How-To Guides*.

The initial step of the process was to review, update and validate historical data, particularly documented disaster events that have affected the area since the original plan was written in 2004. This was accomplished via the internet research, by telephone and personal interviews, and review of information from federal, state and local government reports. Resources used included:

- National Weather Service database
- US Department of Agriculture reports
- US Census Bureau reports
- State Fire Marshall Office reports
- State Department of Agriculture reports
- Butte County Public Library
- Butte County Historical Society records
- Butte County Agricultural Extension Service data
- Belle Fourche Chamber of Commerce

Findings of the review were presented to the LEPC on 22 January 2009. Using this data the LEPC validated the natural and man-caused events most likely to impact Butte County. After developing a list of public and commercial infrastructure, values and structures, business and private resources, a risk and vulnerability assessment was completed. This became the focus for developing the mitigation strategies and prioritizing mitigation projects.

Four public input meetings were conducted: Vale (7 April 2009), Nisland (18 December 2009), Newell (19 January 2010) and Belle Fourche (18 February 2010). At each meeting an

explanation of the Pre-Disaster Mitigation Program, the planning process, and the County effort were discussed. These meetings provided an opportunity to gather support, identify additional critical public and private infrastructure and resources, recruit participants to assist in the planning effort, and establish points of contact for specific issues and analyses. The meetings facilitated public discussions on hazards, establishing the effects of disasters on critical infrastructure, developing ideas for mitigating the impact of disasters, and determining the issues that concern each jurisdiction and public in general. Minutes from each meeting are included in Section XI, Appendix 1, to this Plan.

The LEPC used data, ideas, recommendations and other inputs gathered at the public meetings, and weighed research data and projected costs for potential projects to refine strategies and prioritize mitigation projects. The LEPC recommendations were incorporated into a draft which was made available to the public and the individual jurisdictions for final review before being formally submitted for approval by the City of Belle Fourche, Newell, Nisland, Vale, and the Butte County Commission. In short, this plan captures the results of the LEPC efforts and public meeting discussions. It shows the consensus of all entities in the projects recommend for each jurisdiction in Butte County.

Mitigation Actions, Project Goals, Feasibility, and Priorities

Mitigation actions are most often thought of as taking the form of structural or non-structural measures. Implementation of mitigation actions can take either form or a combination thereof. There are primarily four basic approaches to mitigation:

- **Altering the Hazard --** Modifying the hazard to eliminate or reduce the frequency of its occurrence. Triggering avalanches under controlled conditions and cloud seeding to force premature precipitation to reduce a storm's energy are typical examples.
- **Averting the Hazard --** Redirecting the impact away from a vulnerable location by using structural devices or land treatment to shield people and development from harm. Dikes, levees, and dams all represent physical efforts implemented to keep the risk away from the people.
- **Adapting to the Hazard --** Modifying structures and altering design standards of construction. Identified problems area such as high wind, earthquake, land sliding or subsidence, and heavily forested terrain all require special building standards and construction practices in order to reduce vulnerability to damage.
- **Avoiding the Hazard --** Keep people away from the hazard area or limiting development and population in a risk area. Enforcement actions such as zoning regulations, building codes and ordinances are intended to restrict, limit, or deny access to specially identified risk areas.

The goal of each mitigation project is to:

- Prevent a hazard or reduce its effects.
- Prevent loss of life in an emergency or during a disaster event
- Prevent damage to critical public and commercial infrastructure
- Maintain essential emergency services and government operations

- Minimize economic impact
- Reduce and minimize damage to public, commercial, and private property
- Be attainable and cost efficient
- Do no harm to people, property or the environment

Criteria for evaluating and prioritizing strategies and projects:

- It must be within the jurisdiction's legal authority
- The project must have the political support of the responsible elected officials and decision-makers?
- The project must be socially acceptable
- The project must be technologically feasible
- The responsible jurisdiction must have the administrative capability to oversee the project
- A cost-benefit analysis must show the project is worth doing
- The size of the area and population affected by the project must justify the investment
- There must be jurisdictional and public support for the strategy or project
- Economic and environmental tradeoffs on the project must not outweigh the benefits

Fluidity of projects must be expected.

- Priority of projects will change based on events.
- Due to limited resources of the political subdivisions, work on mitigation projects will depend on manpower and financial capabilities.
- Priority will be affected by public need, public attitudes, and desires.
- Priority of a project may change if a special interest group promotes it.
- Priority of a project may change if a funding mechanism becomes available.

Public Comment and Jurisdictional Approval

Following final review and approval by the LEPC, the draft plan was opened for a 30-day comment period. Inputs were discussed and changes made pursuant to submitting the plan for approval by the affected jurisdictions and the Butte County Commission. See Section X.

Review

The Butte County Emergency Manager, along with the Butte County Local Emergency Planning Committee should assess the plan annually and make needed additions, deletions or revisions.

In addition, an evaluation of success of mitigation strategies and projects should be conducted by the Butte County Emergency Management Office with assistance from appropriate agencies and political subdivisions after each disaster event but not less than annually.

Use of information included in this plan should be used in developing and reviewing other County and local emergency plans. In addition, planners at all levels should refer to the information contained in this plan when designing and seeking approval of development projects.

References

State and Local Mitigation Planning How-To Guide: Getting Started (FEMA 386-1)

State and Local Mitigation Planning How-To Guide: Understanding your Risks (FEMA 386-2)

State and Local Mitigation Planning How-To Guide: Developing the Mitigation Plan (FEMA 386-3)

State and Local Mitigation Planning How-To Guide: Using Cost-Benefit Reviews in Mitigation Planning (FEMA 386-5)

State and Local Mitigation Planning How-To Guide: Integrating Historic Property and Cultural Resource Considerations Into Hazard Mitigation Planning (FEMA 386-6)

State and Local Mitigation Planning How-To Guide: Integrating Manmade Hazards Into Mitigation Planning (FEMA 386-7)

III. JURISDICTIONAL INFORMATION

Butte County

Butte County is located in western South Dakota.

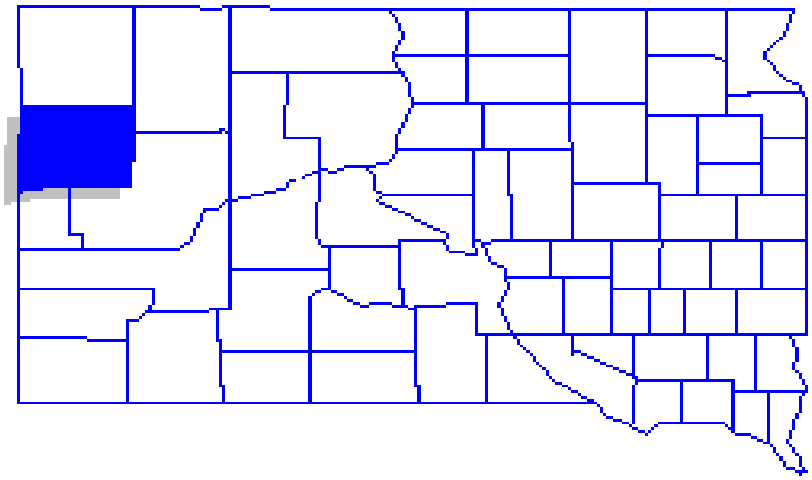


Figure 1 – Location of Butte County, South Dakota

It is bordered by Lawrence County and Meade County on the south, Meade and Perkins County on the east, and Harding County on the north. To the west is Carter County, Montana, and Crook County, Wyoming.

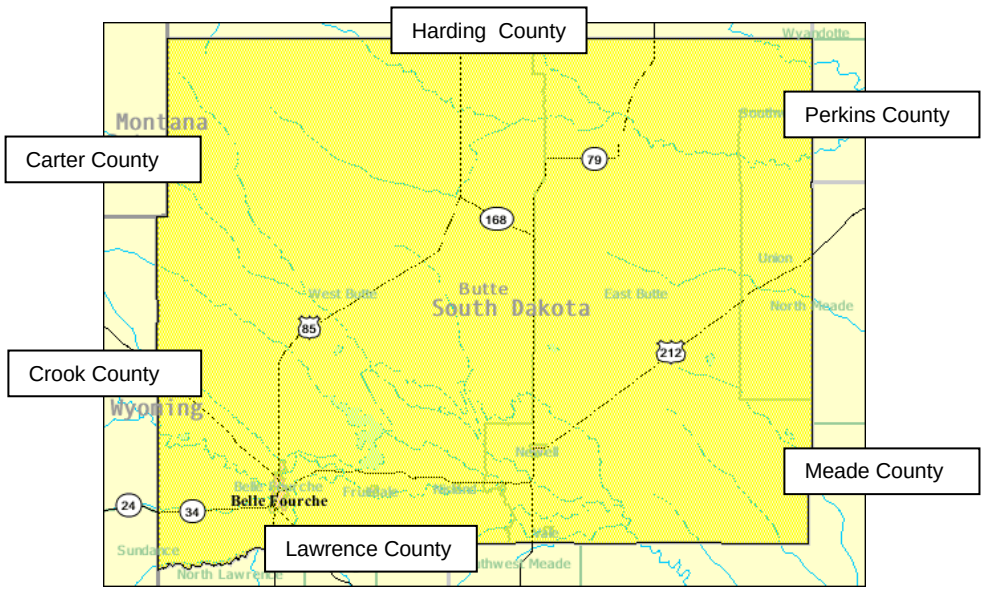


Figure 2 – Butte County

The County is comprised of a total area of 2,266 square miles; 2,249 square miles (1,439,360 acres) is land and 18 square miles (0.79%) is water.

Topography, Soils and Vegetation. The Belle Fourche River Valley west of the city of Belle Fourche is part of the bentonite-rich Grey Shale Foothills, the lowest elevations of the Black Hills, which extend south and west of Butte County. This area is characterized by soft, dark grey shale, often with dwarf ponderosa pine and burr oak. South of Belle Fourche in the Redwater River watershed the area is more heavily treed with significant stands of ponderosa pine and steep brushy draws. North and east of Belle Fourche the land is characterized as rolling plains with scattered buttes and badlands type formations. There are deep, steep draws sculpted by seasonal water courses which make access by ground vehicles difficult at best and sometimes impossible. Soils are mostly heavy clay-loams considered medium to low fertility and moderate to very low available water capacity. Permeability is slow or very slow and runoff is medium to rapid. This increases risk of flash flooding which is compounded by ease of erosion. This area, which makes up roughly two thirds of Butte County, is classified as "northern wheatgrass-needle grass plains" more often referred to as "short grass prairie." The dominant vegetation includes western wheatgrass, green needle grass, sideoats grama, blue grama, needle-and-thread, threadleaf sedge, little bluestem, and buffalo grass. Grass cover is fragile and easily disturbed. Many forbs and some shrubs occur throughout although in lesser densities than eastern South Dakota. Some of the more common forbs and shrubs are western snowberry, leadplant, scarlet globe mallow, western wallflower, American vetch, prickly pear, fringes sagewort, scrufpeas, purple coneflower, prairie coneflower, dotted gayfeather, and Missouri goldenrod. Several species of sagebrush are common to the native rangelands of Butte County. Wild plum, golden currant, chokecherry, silver buffaloberry, and Russian olive are found in the southern half of the County, usually along larger seasonal streams. Along the Belle Fourche and South Moreau Rivers, stands of plains cottonwood and green ash are common.

The northern two thirds of Butte County, with the exception of some dry land farming of cereal grains, is used for rangeland grazing, primarily sheep and cattle. Some grass, mostly in draws and bottoms along seasonal streams, is hayed for winter forage.

Approximately 102,000 acres in Butte County are actively farmed. Small grains, such as wheat, barley and oats, are found on dryland farming operations throughout the County. In the southern third of the County east of Belle Fourche, on either side of the Belle Fourche River, the alluvial plain consists of irrigated farmland served by the Belle Fourche Irrigation District or the river itself. The irrigation project encompasses approximately 140,000 acres, 57,187 acres of which are actively irrigated. Primary crops are alfalfa, and corn. Many of the taller grasses, such as various bromes, clovers, and blue grasses are also found here.

Many farms and ranches throughout Butte County have shelter belts around house, barns and out buildings. Many of these shelter belts have Chinese elms, cedars, and various non-native trees and shrubs

Land Ownership. Land ownership is primarily private. However, large tracts are owned by federal and state governments and administrated by various agencies. Much of the

government-owned lands are leased to private operators for grazing. Table 1 shows general ownership of lands in Butte County.

Table 1 – Land Ownership in Butte County

Owner	Acres	Percent	Land Use
Bureau of Land Management	145,644	10.12	Grazing Leases
Bureau of Reclamation	14,652*	1.02	Belle Fourche Reservoir, irrigation control infrastructure/canals *includes water surface area
State of South Dakota	74,484	5.17	Grazing Leases - Schools & Public Land. Outdoor Recreation - GF&P
Private	1,204,580	83.69	

Watersheds, Rivers and Lakes in Butte County.

There are three major rivers in Butte County.

Belle Fourche River. The Belle Fourche River is a natural, continuously flowing stream that drains portions of Butte and Lawrence, Counties in South Dakota and flows into the Cheyenne River in Meade County. The River enters Butte County from Wyoming 18 miles northwest of Belle Fourche. It flows generally east through the southern quarter of the County to the point where it enters Meade County 10 miles east of Vale. The watershed encompasses approximately 2,000,000 acres (3,200 sq. miles)

In general, the majority of water comes into the watershed from the Belle Fourche at the state line and from the Redwater River. The Belle Fourche Reservoir inlet takes almost half of this inflow and delivers it to the reservoir. Horse Creek and Whitewood Creek add a small amount of water to the system downstream of the reservoir inlet.

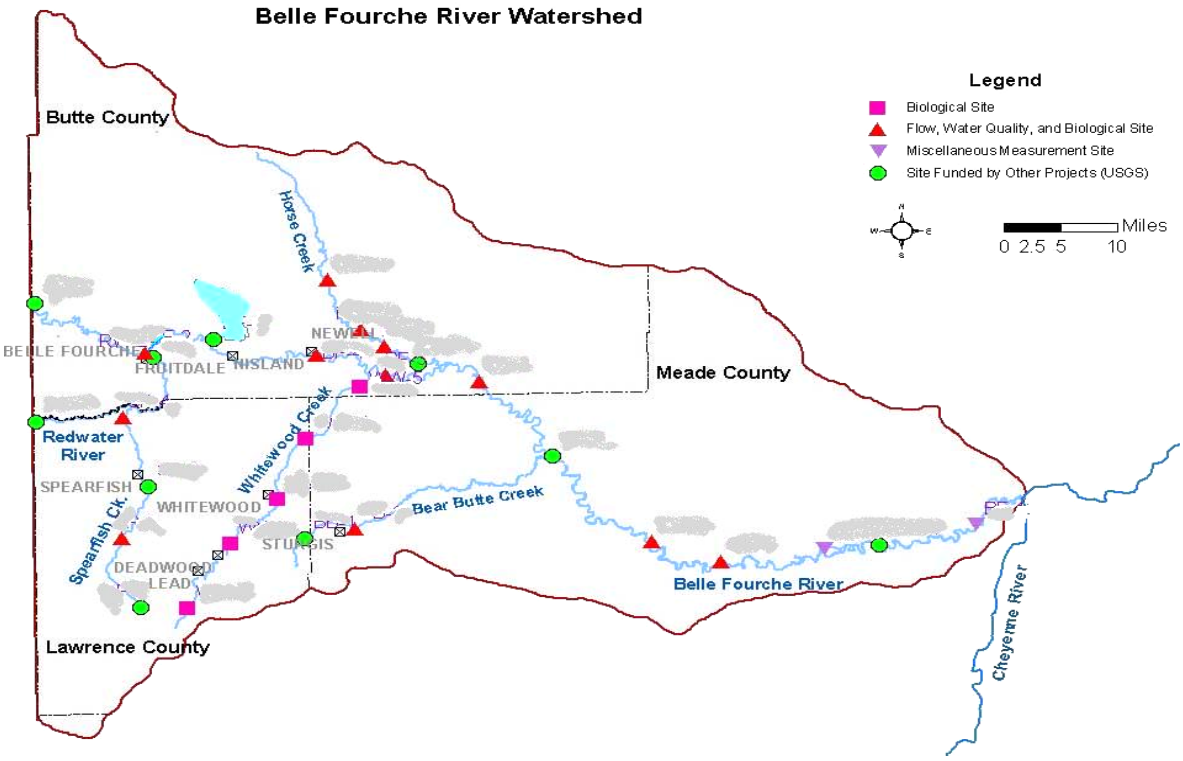


Figure 3 – Belle Fourche River Watershed

Redwater River. The Redwater River forms a 12-mile portion of the southern boundary of Butte County before turning north to join the Belle Fourche River near the City of Belle Fourche. Spearfish Creek makes up almost half of the water of the Redwater River. Water from the river is also used for irrigation by agricultural operators along its valley.

South Moreau River. The South Moreau River is a seasonal stream that flows southeast from its source in Harding County, entering Butte County 10.5 miles west of US Highway 85. The river traverses the northern third of the County, entering Perkins County 16 miles southeast of Hoover.

There are two large man-made lakes in Butte County.

Belle Fourche Reservoir (Orman Dam). The Belle Fourche Reservoir is located about 10 miles northeast of Belle Fourche, north of US Highway 212. The reservoir is formed by a homogeneous earthfill dam 6,262 feet long and 122 feet high constructed across Owl Creek, an intermittent stream tributary to the Belle Fourche River. The primary purpose of the reservoir is regulatory storage of water for irrigation for 57,187 acres in the general area of Newell, Vale, and Nisland along the valley of the Belle Fourche River. However, flood control, fish and wildlife conservation, and recreation benefits are inherently provided. Active storage capacity of the dam is 185,200 acre-feet and a water surface area of 8,040 acres. Dead storage is 6,800 acre-feet. The Belle Fourche Reservoir receives about 120,000 acre-feet of water annually from the Belle Fourche River.

A diversion dam on the Belle Fourche River, about 1.5 miles northeast of the City of Belle Fourche and downstream of the confluence of the Redwater River, directs water down a 6.5 mile inlet canal to the reservoir. Flow from the diversion dam into the canal is controlled by a diversion dam control house. Flow from the reservoir is through two controlled outlet works through the base of the dam, one each for the north and south canals. A supply, distribution and drainage system serving the irrigated lands consists of 94 miles of canals, 450 miles of laterals, and 232 miles of drains.

Irrigation water from Belle Fourche Reservoir is critical to the agricultural economy of Butte County. Consequently, the facilities which control inflows into and outflows from the reservoir and the metering facilities along the canals are considered critical infrastructure.

The 6,731 acres of land which surrounds the reservoir is owned by the US Department of Interior, Bureau of Reclamation. Rocky Point Recreation Area, managed by the South Dakota Game, Fish and Parks Department, is a 327 acre portion of the Reclamation land on the southwest side of the reservoir. Public camping facilities and boat ramps have been developed for recreational use of the reservoir. Below the dam along the Owl Creek drainage, a 164 acre parcel of Reclamation land is managed by the South Dakota Game Fish and Parks Department, Wildlife Division, as a wildlife production area. This land is open for public hunting.

The Belle Fourche River is dammed in eastern Wyoming forming Keyhole Reservoir which provides supplemental storage for irrigation water for the Belle Fourche Irrigation Project.

Water from a failure of the Keyhole dam could be only partially diverted through the inlet canal into the Belle Fourche Reservoir. This could result in flooding along the Belle Fourche River and in the City of Belle Fourche. Failure of Orman Dam would inundate portions of the Town of Nisland and properties downstream in the area of Newell and Vale in Butte County. Inundation maps of the areas downstream of the dam are included in Section XI, Appendix 2, to this Plan.

Newell Lake. Newell Lake is located 8 miles north of Newell, 2 miles east of SD Highway 79. The 183 surface acre lake is formed by an earthfill dam constructed across Willow Creek. The lake and 617 acres of land surrounding the lake is state-owned and managed by SD Game Fish and Parks as a recreation and game production area.

Demographics. The U.S. Census of 2000 shows there were 9,094 people, 3,516 households, and 2,468 families residing in the County. The population density was 4 persons per square mile. There were 4,059 housing units at an average density of 2 houses per square mile. The average household size was 2.55 and the average family size was 3.07. In the County, the median age was 38 years. This information and other demographic data are included in Table 2.

Table 2 – Demographics (U.S. Census Data - 2008 Estimates)

	Number	Percent		Number	Percent
Population	9539		Housing Units	4446	
Male		49.4%	Owner Occupied		73.2%
Female		50.6%	Multi Unit		13.6%
Under 5 years		7.2%	Median Value Owner-Occupied	$60,200	
Under 18 years		24.3%	Households (2000)	3516	
62 years and older		15.2%	Persons Per Household	2.55	
Race			Median Household Income (2008)	$39,348	
White		96.1%	Per Capita Income (1999)	$13,997	
Hispanic/Latino		3.6%	Persons Below Poverty Level (2008)		14.5%
Native American		2.0%	Total Number of Firms (2002)	791	
Black/African American		0.2%	Private Non-Farm Business (2007)	308	
Other		0.2%	Private Non-Farm Employment (2007)	1939	

Butte County is growing. From 1990 to 2000 the population increased 1,180, or 14.9% according to census figures. From 2000 to 2008, the change was 5.5%. More importantly, the number of housing units from 1990 to 2000 in the County increased 557, up 15.9%. U.S. Census projections indicate continuing growth. From the 2000 baseline of 4,059 units, projections were for the addition of 164 units by July 2005 and 387 by 2008. Based on increased County tax revenues from new homes, census projections appear somewhat low with housing growth occurring primarily in and around the edges of Belle Fourche and the southwestern portions of the County.

Climate. (Data provided by the National Weather Service.)

The climate varies across the county due to the large size and variations in topography and elevation. The southwestern section of Butte County is hilly with some timber; this area receives more precipitation.

The county receives about 62% (226 days) of possible sunshine.

The climate is characterized by cold winters and hot summers. The average daily high temperature during the winter (December through February) is 33 degrees and the average low temperature is 10 degrees. Low temperatures fall below zero degrees about 27 times a year and -20 degrees about three times a year. During the summer (June through August), the average daily high temperature is 84 degrees and the average daily low temperature is 56 degrees. Temperatures reach 90 degrees about 30 days a year and 100 degrees about four days a year.

The annual mean wind speed is 11 miles per hour with predominant wind direction from the northwest.

Precipitation. (Data provided by the National Weather Service.)

Butte County is quite arid. Annual precipitation ranges from around 14 inches in the northwestern part of the county to around 20 inches in the southwestern portion of the county.

The months with the highest average precipitation are May and June, averaging 2.70 and 2.80 inches respectively. The months with the lowest average precipitation are December and January, which average 0.35 and 0.38 inches, respectively. Precipitation during the growing season (May through September) has ranged from four inches in 1936 to 22 inches in 1923.

About once in every two years, a rainfall of an inch an hour occurs. Rainfall of two inches in 24 hours occurs once in two years.

Seasonal snowfall has ranged from 11.5 inches in 1963-1964 to 82.6 inches in 1995-1996.

The table below shows the greatest 24 hour precipitation totals, which may not represent storm totals if the storm lasts more than one day.

Table 3 – Greatest 24-Hour Precipitation Totals (National Weather Service)

Rainfall (inches)		**Snowfall (inches)**	
Amount	Date	Amount	Date
3.14	25 Sep 1986	18.0	6 Nov 2008
2.70	20 May 1982	15.8	1 May 1967
2.55	18 Jun 1998	13.0	25 Mar 2009
2.52	15 Jun 1982	12.4	12 Apr 1996
2.32	9 Jun 1964	12.0	2 May 2008
2.20	23 May 2008	12.0	28 Feb 2001
2.20	23 Aug 1973	12.0	29 Mar 1977
2.20	22 May 1962	12.0	14 Mar 1973
2.16	13 Jun 1981	10.0	6 Apr 1997
2.15	13 Jul 1976	9.8	23 Dec 1984

The following map shows average annual precipitation distribution in South Dakota. Most of Butte County is less than 16 inches.

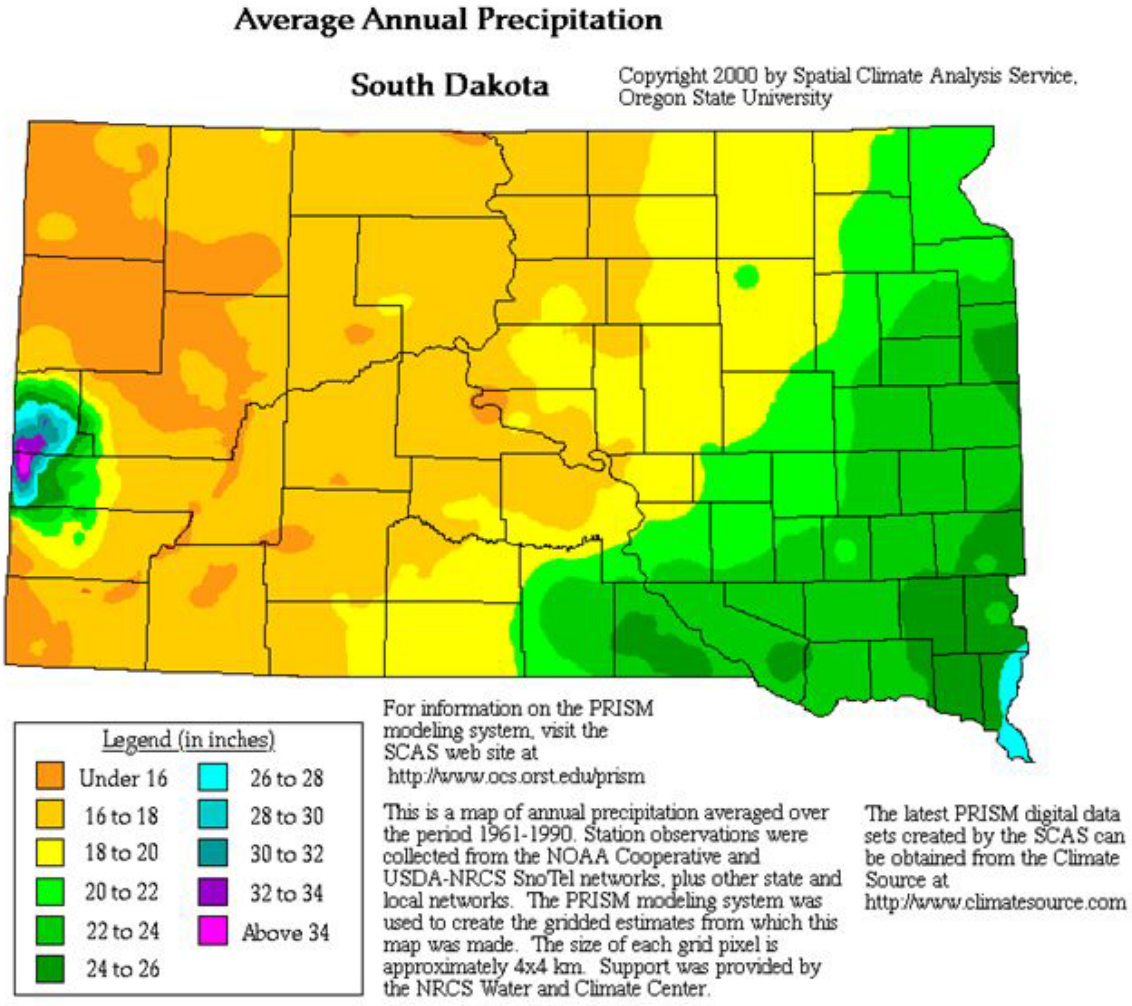


Figure 4 – Average Annual Precipitation in South Dakota

Political Subdivisions. The County is divided into two townships, Union and Vale; and two areas of unorganized territory: East Butte and West Butte. See Figure 1. Butte County has a County Commission style of government.

There are eight communities in Butte County: Belle Fourche, Newell, Nisland, Vale, Fruitdale, Castle Rock, Hoover and Arpan.

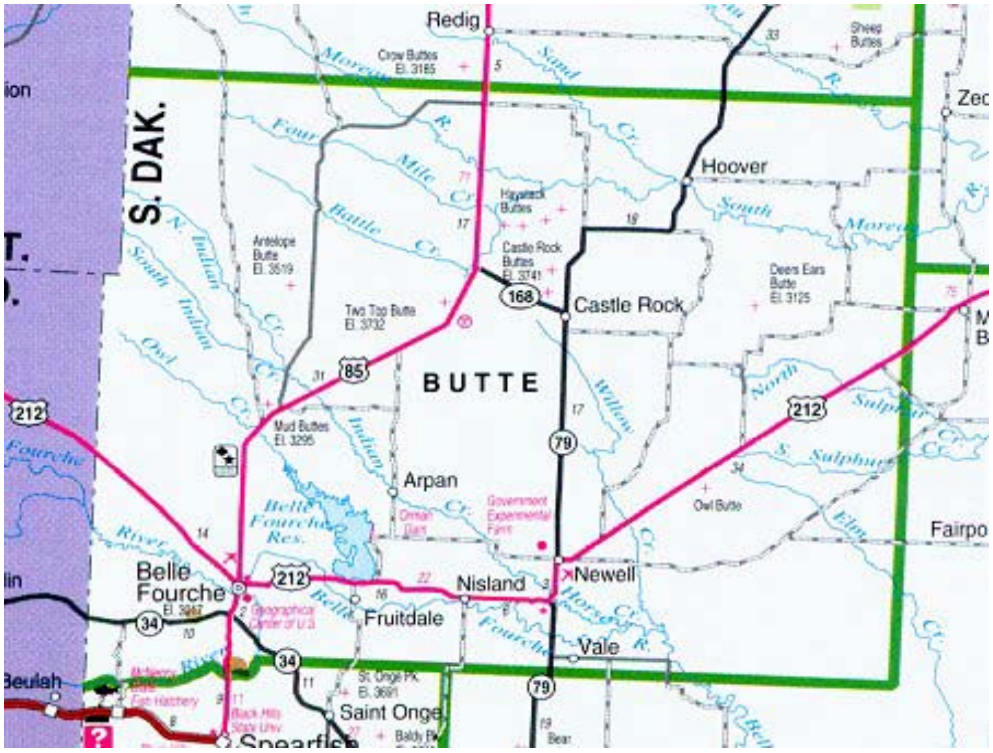


Figure 5 – Highway Map

Belle Fourche. Belle Fourche is located in the southwest corner of Butte County. It is the largest community in the County. The city is located on US Highway 85 about 5 miles north of the Lawrence County line. It is 10 miles north of Spearfish and Interstate Highway 90. South Dakota Highway 34 passes through the southern edge of the city and US Highway 212 passes through on the north edge. The Wyoming state line is 5 miles to the west. The Redwater River joins the Belle Fourche River near the southeastern edge of town. Belle Fourche city government consists of a mayor and a city council. Emergency services are provided by the county volunteer ambulance service, with a facility located in the City, and a volunteer fire department. Law enforcement is provided by a City Police Department.

Newell. Newell is located at the junction of US Highway 212 and SD Highway 79 in southeastern Butte County. It is situated 5.5 miles north of the Belle Fourche River and 9 miles north of the Meade County line. Newell has a mayor and city council type of government. A county volunteer ambulance service facility and a volunteer fire department are located in the City. Law enforcement is provided by the Butte County Sheriff's Department.

Nisland. The town of Nisland is the third largest town in Butte County. It sits on the north bank of the Belle Fourche River on US Highway 212, 6 miles west of the SD Highway 79 junction and 16 miles east of Belle Fourche. Nisland has a town council and council president. Ambulance service is provided from Newell and law enforcement is provided by the Butte County Sheriff's Department. Nisland has volunteer fire and rescue department.

Vale. The town of Vale is located in the southeastern corner of Butte County. It is situated one mile north of the Butte-Meade County line, one mile east of SD Highway 79 and is located approximately one mile south of the Belle Fourche River. Vale has a township Board. Ambulance service is provided from Newell; law enforcement is provided by the Butte County Sheriff's Department. Vale has a volunteer fire department.

Fruitdale. The town of Fruitdale sits on the north bank of the Belle Fourche River one mile south of US Highway 212. It is located 7.5 miles east of Belle Fourche and 7.5 miles west of Nisland. The town has town council with a council president. Ambulance service is provided from Belle Fourche and law enforcement is provided by the Butte County Sheriff's Department. The town has no fire department and is on the western edge of the Nisland-Arpan Fire Zone.

Castle Rock. Castle Rock is 17 miles north of Newell on SD Highway 79 in central Butte County. The town site is just south of the SD Highway 168 junction, which runs 6 miles between US Highway 85 to the west and SD Highway 79. There is no specific census data for Castle Rock. Ambulance service is provided from Newell and law enforcement is provided by the Butte County Sheriff's Department. Castle Rock has a volunteer fire department. There is no central government

Hoover. Hoover is located in northeastern Butte County on the east side of SD Highway 79, 18 miles northeast of Castle Rock. It is situated 6.5 miles south of the Harding County line and 15 miles west of the Perkins County line. The town site is at the confluence of the South Moreau River and Sand Creek. Ambulance service is provided from Newell and law enforcement is provided by the Butte County Sheriff's Department. There is no central government. Hoover has no fire department but is in the Castle Rock Fire Zone. There is no specific census data for Hoover.

Arpan. The town site of Arpan is located in south central Butte County on Indian Creek, 7 miles north of US Highway 212 and 10 miles south of US Highway 85. Ambulance service is provided from Belle Fourche and law enforcement is provided by the Butte County Sheriff's Department. There is no central government. Arpan is in the Nisland-Arpan Fire Zone. There is no specific census data for Arpan.

Table 3 shows Butte County census data for 2000. Analysis of the data shows 61.6% of Butte County's 9,094 residents lived in the cities of Belle Fourche, Newell, Nisland, Vale, and Fruitdale, which occupy only 0.23% of the County's 2,248.51 square mile land area. Of the 4,059 housing units, 65.2% were in these five communities. These figures illustrate that the County is predominantly rural with low population density (1.56 persons per square mile)

and housing density (0.63 housing units per square mile) in the two unorganized territories and Union Township.

Table 4 – U.S. Census Data for Butte County (U.S. Census Bureau 2000 Data)

Community	Location	Area in Square Miles	Land Area	Population	Population Density per Square Mile	Housing Units	Housing Units per Square Mile
Butte County	NA	2266.36	2248.51	9094	4.0	4059	1.8
Belle Fourche	44°40'02″N, 103°51'01″W	3.23	3.16	4565	1446.9	2122	672.6
Newell	44°42'0'9″N, 103°25'23″W	1.00	1.00	646	646.9	337	337.5
Nisland	44°40'25″N, 103°33'11″W	0.25	0.25	204	800.7	100	392.5
Fruitdale	44°40'05″N, 103°41'47″W	0.32	0.32	62	195.2	29	91.3
Vale Twp	44°37'12″N, 103°24'12″W	0.39	0.39	121	312.5	60	154.9
Castle Rock	44°42''53″N, 103°25'13″W	NR	NR	NR	NR	NR	NR
Hoover	44°06'44″N, 103°16'04″W	NR	NR	NR	NR	NR	NR
Arpan	44°46'50″N, 103°38'58″W	NR	NR	NR	NR	NR	NR
Union Twp	NA	141.52	140.77	31	.02	17	0.1
Butte East UT	NA	840.23	836.75	797	1.0	323	0.4
Butte West UT	NA	1279.42	1265.88	2668	2.1	1071	0.8

NA – Not Applicable
NR – Not reported.

Belle Fourche is the county seat for Butte County. The population is found largely in the southern half of the county. The population is not greatly affected by tourism with the exception the first week of July when the Black Hills Roundup takes place. Rodeos, parades, and amusement rides attract tourists to the Belle Fourche area during this event.

Property Valuations. Property valuations for jurisdictions, based on the Butte County Equalization Office 2009 assessment data, are summarized in Table 5. These values do not include the properties considered as tax exempt such as the churches, schools, community halls, civic organization properties, or government facilities such as post offices and office buildings.

Table 5– Assessment Values for Butte County (Butte County Equalization Office)

Community	Structures (Non-Ag)	Land (Non-Ag)	Structures (Ag)	Land (Ag)	Total
Butte County	$120,268,520	$57,249,213	$8.922.075	$161.563.167	$348,002.975
Belle Fourche	$173,337,846	$50,686.747	$85,375	395,501	$224,505,469
Newell	$11,861,495	$2,891,068			$14,752,563
Nisland	$2,953,860	$429,029		$2,017	$3,384,906
Fruitdale	$1,735,385	$564,226			$2,299,611
Vale Twp	$2,401,010	$987,022	$425	$57,251	$3,445,708
Total	$312,558,116	$112,807,305	$9,007,875	$162,017,936	$596,391,232

Infrastructure. For a complete listing of public, commercial and private infrastructure in Butte County, refer to Section XI, Appendix 3.

Roads and Highways. See Figure 4. Butte County is served by two US Highways and three State Highways. US Highway 212 is the major east-west thoroughfare, providing direct

access to the towns of Newell, Nisland, and Belle Fourche. The Highway enters Butte County on the east from Meade County and leaves Butte County on the west near Colony Wyoming. US Highway 85 is the major north-south route. The highway enters Butte County from Lawrence County on the south and passes through Belle Fourche, continuing north to Harding County. SD Highway 34 enters the county in the southwest corner and crosses Highway 85 on the southern edge of Belle Fourche, continuing west to the Wyoming state line. SD Highway 79 enters the county from Meade County to the south, providing access to Vale and Newell. From Newell it continues north, passing Castle Rock and Hoover before entering Harding County. SD Highway 168 connects SD Highway 79 near Castle Rock with US Highway 85 approximately 31 miles north of Belle Fourche.

Butte County maintains a county road system throughout the county. There are 843 miles of gravel roads.

Railroad. The Dakota, Minnesota and Eastern (DM&E) Railroad roughly parallels the route of State Highway 34 to Belle Fourche and then on west to Wyoming. Bentonite is a major commodity for the railroad.

Air Service. The Belle Fourche Municipal Airport (EFC) is a small general aviation airport four miles north of Belle Fourche. The asphalt runway (14-32) is 4501 feet x 60 feet. A turf runway (18-36) is 3655 feet x 120 feet.

Utilities. For the purpose of this plan, natural gas service, electric, telephone, community water systems, sewer systems and private water sources are considered utilities.

Natural Gas. The Williston Basin Pipeline provides the only natural gas supply pipeline into Butte County. Montana Dakota Utilities provides natural gas to individual customers with a large facility located north of Belle Fourche on MDU Loop. Natural gas is generally used for home heating in residential areas in and around Belle Fourche. Other sources of heating for County residences and businesses include propane, electricity, fuel oil, solar power, and wood.

Electric. Providers or those with physical property (sub-stations) within Butte County include:

Butte Electrical Cooperative
Black Hills Power and Light

Telephone. Providers or those with physical property (substations) within Butte County include:

Qwest Communications
Prairiewave Communications
Golden West Communications Cooperative
West River Cooperative Telephone Company

Community Water Systems. The South Dakota Department of Environment and Natural Resources lists 12 public drinking water systems serving communities and rural residents in Butte County.

Table 6 – Water Systems in Butte County

System Name	Owner	System Type	Service Area	Population Served	Service Connections	Primary Water Source	EPA ID
Belle Fourche	Local Gov	Community	Municipality	4565	2200	Groundwater Supply (2 wells)	0037
Belle Fourche Livestock Exchange	Private	Private	Restaurant	70	1	Groundwater Supply (1 well)	1048
Black Hills Water Company	Private	Community	Wholesaler	0	1	Groundwater Supply (2 wells)	2144
Butte-Meade Sanitary Water District	Private	Community	Rural Water System	2030	812	Groundwater Supply (3 wells)	0223
Fruitdale	Local Gov	Community	Municipality	62	28	Purchased Groundwater (Butte-Meade)	0135
Newell	Local Gov	Community	Municipality	646	292	Groundwater Supply (3 wells)	0222
Nisland	Local Gov	Community	Municipality	204	85	Groundwater Supply (1 well)	0225
Riverside Trailer Court	Private	Community	Trailer Court	60	26	Purchased Groundwater (Butte-Meade)	0508
Sandstone Water Company	Private	Community	Homeowners Association	300	116	Purchased Groundwater (Black Hills Water Co.)	2143
Sandstone Water Company-West Addition	Private	Community	Homeowners Association	200	78	Purchased Groundwater (Wilen Enterprises Water)	2220
Vale Sanitary District	Private	Community	Homeowners Association	150	60	Groundwater Supply (1 well) Purchased Groundwater (Butte-Meade)	0415
Wilen Enterprises Water Company	Private	Community	Wholesale	0	1	Groundwater Supply (1 well)	2257

Private Water Systems. Many rural residents not served by rural water systems, use private wells or cistern systems for their drinking water. The South Dakota Department of Environment and Natural Resources Water Quality Database shows 18 private wells in Butte County. These include 10 wells for domestic use and 6 wells for stock and irrigation. However, surface water from stock dams and seasonal ponds and creeks provide most of the water for livestock.

Table 7 – Private Wells in Butte County

Ownership	Owner	Location	Aquifer	Depth	Usage	Well No.
Private	F. Brady	NE NW SEC. 11, T. 007 N., R. 01 E.	Minnelusa	1440	Irrigation	W61
Private	L. Widdoss	NW SE SE NE SEC. 02, T. 007 N., R. 02 E.	Minnelusa	1350	Domestic	W47
Private	D. Helmer	NE SW NE SW SEC. 02, T. 007 N., R. 02 E.	Spearfish	989	Stock	W48
Private	L. Helmer	NW NW SW SW SEC. 02, T. 007 N., R. 02 E.	Minnekahta	943	Domestic	W49
Private	D. Helmer	NW SE NE SE SEC. 02, T. 007 N., R. 02 E.	Minnelusa	1290	Domestic	W50
Private	B. Carlson	NE SE SEC. 06, T. 007 N., R. 02 E.	Madison	2400	Domestic	W58
Private	Wheeler Welding	SE NE NE SE SEC. 03, T. 008 N., R. 02 E.	Lakota	705	Domestic	W9
Private	A. Jarvi	NW SE SW SE SEC. 04, T. 008 N., R. 02 E.	Lakota	820	Stock	W10
Private	M. Stettler	NW SW SE SW SEC. 14, T. 008 N., R. 02 E.	Lakota	310	Domestic	W14
Private	M. Nordstrom	NW SW SE SEC. 16, T. 008 N., R. 02 E.	Lakota	340	Domestic	W17
Private	Belle Fourche Country Club	SE SW NW NW SEC. 22, T. 008 N., R. 02 E.	Minnelusa/ Madison	2590	Irrigation	
Private	J. Graff	SW NE SW SW SEC. 23, T. 008 N., R. 02 E.	Lakota	240	Domestic	W19
Private	D. Nickelson	SE SE SEC. 28, T. 008 N., R. 02 E	Madison	2220	Domestic	W86
Private	D. Nickelson	NW SW SE NE SEC. 33, T. 008 N., R. 02 E.	Lakota	340	Domestic	W22
Private	R. Helmer	SW NW SEC. 02, T. 008 N., R. 03 E.	Lakota	290	Stock	W82
Private	J. Dusing	SE NW SEC. 02, T. 008 N., R. 03 E.	Minnelusa	2225	Irrigation/ Stock	W23
Private	Olson	SE NE SEC. 27, T. 009 N., R. 03 E.	Minnelusa/ Madison	4016	Irrigation	W3
Private	K. Bean	SE NE NE NW SEC. 29, T. 009 N., R. 03 E.	Madison	3511	Irrigation	W4

Sewer Systems. The communities of Belle Fourche, Newell, Nisland and Vale operate community sewage treatment facilities. Most rural residents have septic systems.

Economy.

Agriculture. The economy of Butte County relies heavily on agriculture. According the 2007 agricultural censes, there were a total of 584 farms in Butte County making up a total of 1,140,405 acres. Of that, a total of 163,375 acres was used for cropland. The largest agricultural operations are mostly cattle production and farming. In 2007 there were nearly 64,000 head of cattle are on the County's farms and ranches. Butte County ranked number one in the State in sheep production with 42,000 head.

Corn is the most produced crop in Butte County; alfalfa and wheat production are next. Most crop production is on irrigated acres along the Belle Fourche and Redwater rivers and in the Belle Fourche Irrigation District. Dryland crops include wheat, oats and barley. Many ranches produce their own feed for livestock, making operations more cost effective.

Table 8 – Agricultural Census Data for Butte County (U.S. 2007 Agricultural Census)

Number of Farms	Land In Farms (acres)	Average Size (acres)
584	1,140,405	1953

Cropland	Farms	Acres
Total Cropland	442	163,375
Harvested Cropland	389	89,343
Irrigated Land	291	47,701

Crop	Farms	Acres	Amount
Corn for Grain	43	3,796	503,304 bushels
Corn for Silage	28	2,805	41,164 tons
Wheat for Grain	32	13,939	442,718 bushels
Oats for Grain	28	1,357	79,955 bushels
Barley for Grain	6	239	10,770 bushels
Sorghum for Silage	3	76	928 bushels
Forage	374	67,455	153,300 tons

Livestock	Farms	Number
Cattle and Calves Inventory	333	63,945
Cattle and Calves Sold	310	47,598
Sheep and Lambs Inventory	101	42,087

Value of Ag Products	Livestock	Crop
$55,443,000	$46,501,000	$8,942,000

Weather plays an intense roll in the cattle industry. Spring blizzards, like the three that occurred in 2009 during calving season, resulted in losses of 15 to 25 percent of April and May calves in Butte County. Losses due to the blizzards were substantial for sheep producers as well.

In addition, hail storms during the growing season can produce significant crop losses for corn, hay and cereal grains. When this occurs, ranchers must buy feed for their herds reducing their operating margins.

Table 9 – Farm Demographics for Butte County (U.S. 2007 Agricultural Census)

Primary Occupation: Farming	Primary Occupation: Other	Average Net Income Per Farm
296	288	$26,765

Table 9 shows that 49.3% of the principle operators of farms and ranches in Butte County work off the farm. Other analysis indicates that even in cases where farming and ranching is the full time job of the primary operator, the spouse often works elsewhere to supplement family income.

Business and Industry. In Butte County, the economic sectors providing employment include agriculture, forestry, fishing and hunting, and mining (19.4%), educational, health and social services (18.0%), and retail trade (12.7%).

Most common industries for males in Butte County:

- Agriculture, forestry, fishing and hunting (21%)
- Construction (15%)
- Mining, quarrying, and oil and gas extraction (9%)
- Accommodation and food services (5%)
- Educational services (4%)
- Truck transportation (4%)
- Public administration (4%)

Most common occupations for males in Butte County:

- Farmers and farm managers (13%)
- Driver/sales workers and truck drivers (7%)
- Agricultural workers including supervisors (6%)
- Other production occupations including supervisors (5%)
- Vehicle and mobile equipment mechanics, installers, and repairers (4%)
- Laborers and material movers, hand (4%)
- Construction trades workers except carpenters, electricians, painters, plumbers, and construction laborers (4%)

Most common industries for females in Butte County:

- Health care (14%)
- Educational services (13%)
- Accommodation and food services (10%)
- Agriculture, forestry, fishing and hunting (7%)
- Public administration (5%)
- Social assistance (4%)
- Food and beverage stores (4%)

Most common occupations for females in Butte County:

- Secretaries and administrative assistants (7%)
- Building and grounds cleaning and maintenance occupations (6%)
- Bookkeeping, accounting, and auditing clerks (5%)
- Information and record clerks except customer service representatives (4%)
- Preschool, kindergarten, elementary and middle school teachers (4%)
- Child care workers (4%)
- Other sales and related workers including supervisors (4%)

Many local businesses support the production agriculture operations. Belle Fourche Livestock Exchange (Belle Fourche), St. Onge Livestock Exchange (Newell), New Generation Feeds (Belle Fourche), several implement dealers and hardware/parts suppliers, and agriculture service businesses are totally dependent on the health of the agriculture economy. Others, such as car dealerships, lumber yards, banks, insurance sales, and restaurants rely on farming and ranching for a large portion of their income.

The largest exception is the American Colloid Plant located west of Belle Fourche. Bentonite mined in Wyoming and in Butte County is processed at the plant.

However, the other leading employers are public service entities. These include:

- Belle Fourche School District
- Newell School District
- City of Belle Fourche
- Belle Fourche Health Care Center

In Butte County, Belle Fourche has the largest number of private businesses. Tables in Section XI, Appendix 3, list important privately owned essential businesses in each community.

IV. HAZARD ASSESSMENT

Overview

Hazard. A hazard is an act or phenomenon that has potential to produce harm or other undesirable consequence to a person or thing. Hazard assessment is the process of identifying and prioritizing those hazards that directly affect or have the potential to affect a jurisdiction and its people. Hazards which were evaluated for the probability of occurrence in Butte County are:

- Natural Hazards.
  - Tornado
  - Severe Thunderstorm (including high wind , microburst and hail)
  - Strong Wind
  - Flood/Flash Flood
  - Dam Failure
  - Drought
  - Winter Storm/Blizzard (including ice storms)
  - Earthquake
  - Landslide
  - Wildfire
- Man-Caused Hazards.
  - HAZMAT Incident (including transportation accidents, industrial and agricultural exposures)
  - Mass Causality Incident
  - Epidemic
  - Terrorism (including chemical, biological, nuclear)/Agricultural Terrorism
  - Aircraft Accident
  - Criminal Activity (including hostage situations, bombings, violence, or arson)
  - Civil Disobedience

Vulnerability. Vulnerability is susceptibility to physical injury, harm, damage or economic loss. A vulnerability assessment provides the extent of injury and damages that might result from a hazard event.

Exposure. Exposure describes the people, property systems or functions that could be lost to a hazard.

Natural Hazards

The National Weather Service, Rapid City South Dakota, compiled the following data specifically for Butte County. All statistics are from data collected 1950-2009, unless otherwise indicated.

Tornado. Tornados in Butte County are infrequent and generally do not cause much damage or injuries, mainly because of the open area and sparse population. Butte County historical area-adjusted tornado activity is significantly below South Dakota state average. It is 3.1 times below overall U.S. average.

Thirteen tornados have been reported in 60 years for an average of 0.2 every year or one tornado every four years. This number is likely low as some tornados may not have been seen by people. Most tornados are single events; only two storm systems have produced multiple tornadoes: two tornados occurred on both June 25, 1975, and August 13, 1993.

The tornados have been small with an average path length of 2.3 miles and the longest was 7.9 miles. They averaged approximately 160 feet wide with the largest estimated at 530 feet wide.

Most tornados caused little or no damage as the probability of striking structures is low. Seven caused light damage (winds estimated between 40-72 mph) and two caused moderate damage (winds estimated between 73-112 mph). One caused significant damage (winds estimated between 113-157 mph), and one caused severe damage when it destroyed outbuildings and the community hall just north of Castle Rock on July 18, 1963 (winds were estimated between 158-206 mph). Average damage total is $35,000; highest: $250,000 (values were not adjusted for inflation).

No fatalities have been recorded since 1916 and only one injury has been recorded since 1950.

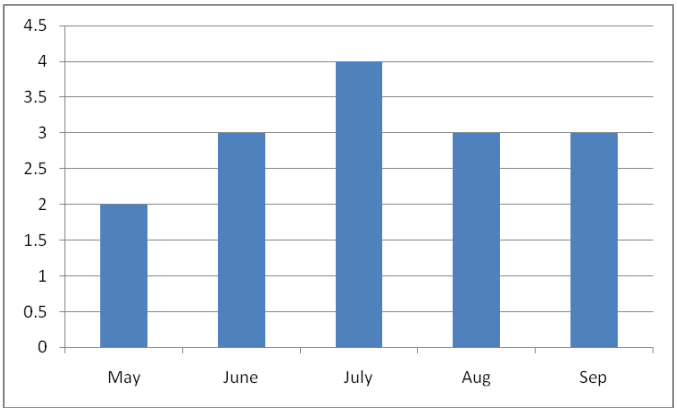


Figure 6 - Tornado Occurrences by Month

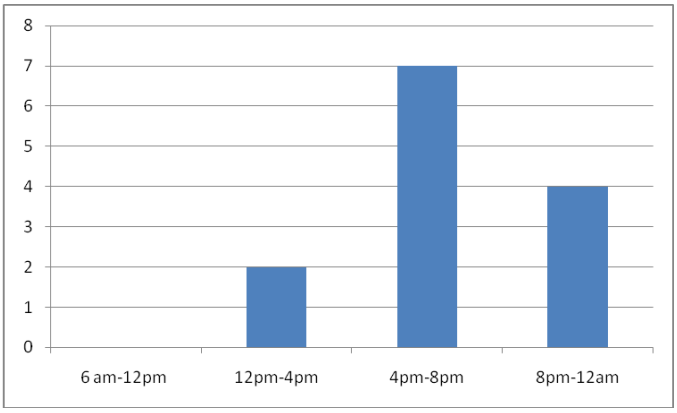


Figure 7 - Tornado Occurrences by Time of Day

Earliest was 12:15 pm; latest was 9:55 pm; mean time: 6:30 pm.

Severe Thunderstorm (including high wind, microburst and hail). Thunderstorms with large hail and strong wind gusts are common. Until 2009, the National Weather Service defined a severe thunderstorm as one with ¾" or larger diameter hail and/or 58 mph or stronger wind gusts. In 2009, the threshold for hail was raised to one inch diameter.

Forty-five thunderstorms have produced hail at least one inch in diameter in Butte County since 1996 when the National Weather Service began using Doppler Radar that was more accurate in detecting storms, averaging three storms a year. Four storms produced hail three inches or larger since 1955. The largest hail reported was five inches on July 2, 1957.

Four inch diameter hail caused 3 million dollars in damage and three injuries in Belle Fourche on July 5, 1998.

Since 1996, 50 storms have produced wind gusts 58 mph or higher; ten have had wind gusts 75 mph (hurricane force) or higher. The highest wind gusts were 87 knots from two storms on July 5, 1996 and July 2, 2005.

Eleven thunderstorms caused significant property and/or crop damage.

On July 23, 2001, a small, intense thunderstorm downburst struck the Redwater Ranchettes Subdivision just south of Belle Fourche. The storm destroyed eight mobile homes, damaged five others, and caused five injuries. Fifteen homes were evacuated.

On July 2, 2005, a line of thunderstorm with winds raced across southern Butte County. Several people at the Belle Fourche Reservoir were injured.

Strong Wind. Strong winds from larger storm systems during the fall through spring can also cause damage. Since 1996 wind speeds 40 mph or higher or gusts greater than 60 mph have occurred 53 times; an average of four times a year.

These systems sometimes cause property damage, generally small trees or signs are blown over, but occasionally there is more significant widespread damage. On April 24, 1996, high winds slammed across western South Dakota. Winds over 80 mph ripped through Belle Fourche during the afternoon. The metal roof of the Mid-State Wool Growers warehouse was torn off and carried 200 yards; stores, cars, and a street light in downtown Belle Fourche were also damaged. State Street was closed for three hours until the debris could be cleared. A mobile home between Nisland and Vale was blown off its foundation. Another mobile home being transported was overturned two miles east of Newell.

Flood and Flash Flooding. Most flooding in Butte County is caused by ice jams and melting snow in the spring. Heavy rain and rain runoff, especially along creeks flowing from the Black Hills, can also cause flooding when the water reaches the Belle Fourche River.

May 5, 1993: Thunderstorms dumped two to three inches of rain, which caused flash flooding along creeks north and east of the Black Hills. As much as 7.5 inches of rain fell south of Fruitdale. Roads in the Fruitdale and Nisland area were covered by the runoff and the Belle Fourche River overflowed its banks south of Newell through the morning of the 6th.

May 27-30, 1996: A slow moving storm system and persistent upslope flow contributed to rainfall amounts of 4 to 8 inches over much of western South Dakota from May 21 through May 27. Widespread flooding began on May 27. Minor property damage, such as flooding to basements, was common. Numerous roads and bridges were washed out and several residents and campers near streams had to be evacuated. River flooding occurred along the Moreau, Cheyenne, Little Missouri, Bad, White, and Little White Rivers.

June 18-21, 1998: Heavy rain during the night and afternoon hours of the 17th and 18th resulted in low land flooding along the South Fork of the Moreau River in northern Butte County.

June 2-3, 2007: Heavy rain across the area on June 1 and 2 resulted in rising creeks across the northern Black Hills and adjacent plains. Many secondary roads were closed. Runoff from recent heavy rain caused minor flooding of the Redwater River, Belle Fourche River, and Hay Creek and roads south of Belle Fourche.

May 6-11, 2008: Heavy rain falling on deep snow remaining from the previous week's blizzard caused flooding over northwestern South Dakota, the northern Black Hills, and the northern foothills. Rainfall amounts on the plains were 0.75 to 1.00 inches. The water content of the snow was two to five inches. Minor flooding occurred along the South Fork of the Moreau River, the Belle Fourche River, Hay Creek, Willow Creek, Frog Creek, Indian Creek, and their tributaries.

May 23-25, 2008: Three to five inches of rain fell over the northern and central Black Hills and eastern foothills. The water covered secondary roads and side streets, washed out several roads and culverts, and flooded yards. Flooding occurred in Nisland, Vale, and Belle Fourche. Minor flooding was observed along the Belle Fourche River around Nisland and Vale, Willow Creek and Dry Creek near Newell, Stinking Water Creek, and Maloney Creek.

June 5-8, 2008: Two and a half to three and a half inches of rain on saturated soils damaged homes and destroyed culverts and roads. The South Fork of the Moreau River near Sand Creek was reported to be a mile wide. Belle Fourche River levels were among the highest levels ever recorded. The Redwater River, Willow Creek, Hay Creek, Indian Creek, and their tributaries flooded. Several stock dams failed and the embankment next to the spillway at Newell Lake eroded but did not result in a breech in the dam.

March 6-7, 2009: Ice jams caused minor flooding along Indian Creek, the South Fork of the Moreau River, and the Belle Fourche River near the diversion canal. Water from Indian Creek flowed over Arpan Road. Several yards in Belle Fourche and pasture land along the Moreau River were flooded.

April 13-18, 2009: Heavy snow from several spring blizzards began to melt in early April, causing extensive flooding across northwestern South Dakota. Minor flooding occurred in Belle Fourche, Vale, Newell, Nisland, and Hoover. US Highway 212 northwest of Belle Fourche was covered with six inches of water.

Dam Failure. Dam failures are rare. There are two larger dams which, because of their location and proximity to communities and farms and ranches downstream, were studied for this plan.

Belle Fourche Reservoir (Orman Dam). Orman Dam is a homogeneous earthfill dam 6,262 feet long and 122 feet high constructed across Owl Creek, an intermittent stream tributary to the Belle Fourche River. Active storage capacity of the dam is 185,200 acre-feet and a water surface area of 8,040 acres. Dead storage is 6,800 acre-feet. A diversion dam on the Belle Fourche River, northeast of the City of Belle Fourche and downstream of the confluence of the Redwater River, directs water into the reservoir through an inlet canal. Flow from the diversion dam into the canal is controlled by a diversion dam control house. The Belle Fourche Reservoir receives about 120,000 acre-feet of water annually from the Belle Fourche River. Flow from the reservoir is through two controlled outlet works through the base of the dam, one each for the north and south canals which provide irrigation to agricultural operations. Irrigation flows are managed by the Belle Fourche Irrigation District Office in Newell. The reservoir and dam are owned by the US Bureau of Reclamation

Newell Lake. Newell Lake is a 183 surface acre lake formed by an earthfill dam constructed across Willow Creek. Willow creek is a seasonal creek running water from spring snowmelt during spring thaw and runoff from seasonal storms during the spring and summer.

Drought. The county as a whole is vulnerable to drought, and wind erosion. Repetitive droughts result in severe economic loss to the cities and County. Dryland farming and livestock production are directly affected. In addition, Belle Fourche and Newell are dependent upon agricultural related businesses. Consequently, the affects of drought are indirectly felt in the local business economy. The irrigated property in Butte County lessens the impact somewhat and federal programs have helped many livestock producers install water lines from wells and rural water systems into pastures. However, if inflows into Belle Fourche

Reservoir are insufficient, irrigation for crop production is reduced with significant economic impact to producers and to the local businesses which depend on agriculture. Along the Belle Fourche River, junior water rights would be reduced or suspended, seriously impacting both livestock and crop production. Most significant droughts:

1885-1905	Drought statewide
1929-1942	Drought was statewide, the event known as "Dust Bowl" years. The most severe years were: 1931, 1934, and 1936.
1954-1962	Drought statewide. The most severe occurred during 1956 and 1959.
1973-1977	Drought, most severe 1976.
1985-1987	Drought was severe in the western part of the state, with the southern part of the county more severe.
1999-2007	The worst years were 2001, 2002, and 2006.

Winter Storm and Blizzard. A winter storm is categorized as heavy snow of 8 inches or more in 24 hours or a combination of snow and strong winds. A blizzard is a winter storm with wind gusts 35 mph or higher and visibility less than ¼ mile.

Over 65 times blizzards or heavy snow storms have occurred in Butte County. These have resulted in substantial loss of livestock and sometimes loss of human lives.

In the period 1990 thru 2001, 24 winter storms occurred. Of those storms, eight produced at least 12 inches of snow. The average is 2.2 winter storms with 12 inches of snow per winter season and 0.73 winter storms with more than 12 inches of snow per winter. Seven storms have produced 18 inches of snow. Eighteen winter storms were blizzards; four had total snowfall of 12 inches or more. Average: 1.6 blizzards per winter season. Winter storms with heavy snow are most common during March and April.

May 1905: A blizzard resulted in thousands of head of livestock lost in western South Dakota.

Blizzards in the state with no data accompanying include 1924, and1943.

Blizzard of January 1949 affected entire state and conditions lasted for weeks. Temperatures hovered about -2 to -8 with heavy snows totaling 24 inches for the month and winds recorded from 40 to 73 mph. Airplanes were pressed into service to deliver food, fuel, and medicine for stranded people. Many people were lost in the storm as were thousands of head of cattle. Snowdrifts were documented in places at 35 feet deep.

January 1952: A repeat of the Blizzard of 1949, cattle loss and human loss was high. Snowed in for months, people depended on airplane dropped supplies.

April 1967: A blizzard resulted in several feet of snow in the northern Black Hills. The storm paralyzed the area for 2 days. The late spring storm caused cattle losses especially in young calves.

March 1973: Blizzard resulted in 2 feet of snow.

Two blizzards in 1975 caused loss of life and loss of livestock statewide.

In 1977 repetitive snow storms/blizzards hit South Dakota in February, March and November. Repetitive closing of Interstate 90 occurred due to 6-8 foot deep snow. Six people died and large numbers of livestock were lost.

October 9, 1982: Ice and snow heavily damaged power lines and trees, many homes damaged due to falling limbs and trees. Snow was 3 to 6 feet deep with winds 40-70 miles per hour. The storm lasted 3 days hitting the northern Black Hills and counties to the north the hardest.

January 1-4, 1996: Ten to 12 inches fell over northwest South Dakota

February 29, 1996: The northern Black Hills received 1.5 to three feet of snow during a 36 hour period starting the evening of February 29 through the morning of March 2.

April 11-13, 1996: Six to 16 inches of snow fell across the Black Hills and western South Dakota. Roads were closed and numerous accidents occurred, but no major injuries were reported. Heavy snow covered the Black Hills and western South Dakota. Accumulations ranged from six inches in the foothills to 15 inches at Mt. Rushmore.

October 26, 1996: A winter storm with heavy snow and gusty northwest winds created blizzard-like conditions over western South Dakota. The heaviest snow fell in the central and northern Black Hills where one to two feet was common. Lead received 38.9 inches, setting an all-time state record for 24 hour snowfall. Winds frequently gusted over 45 mph, reducing visibility to zero and creating drifts several feet deep. Many roads in the Lead-Deadwood area were blocked for over 24 hours. The wet heavy snow downed numerous power lines and poles. Electric service to some rural areas was out for five days. Damage to power lines and poles in western South Dakota was estimated near $600,000.

November 13-15, 1996: Freezing drizzle coated power lines and roads throughout western South Dakota. In Perkins County, up to 3 inches of ice was reported on power lines. Over 300 distribution poles were downed at a cost of over $300,000. In and around Rapid City, over 40 car accidents were reported, resulting in the hospitalization of four people with serious to critical injuries.

November 30 and December 1-2, 1996: Heavy snows were reported from the northern foothills of the Black Hills through Butte and northern Meade counties. Eight inches fell in Spearfish, 12 inches fell in Maurine (20 miles west of Faith), and 12 inches fell in Hoover (40 miles northeast of Belle Fourche) in less than 12 hours.

The winter of 1996-1997 caused extensive loss to the cities, and to county and livestock owners. There was extensive damage to infrastructure due to repetitive blizzards and rapid snowmelt causing flooding. One power company in the area estimated loss of power poles and electrical lines in excess of $620,000. Ranchers lost in excess of 9,000 head of livestock in South Dakota. Ice on lagoons, dams resulted in scouring of the shorelines, and repair costs were extensive.

April 2006: Northwestern South Dakota experienced a severe ice storm and blizzard. This storm resulted in a week long power outage in the majority of Butte County. Nearly 3000 power poles were destroyed. Power to the Butte County Courthouse and Dispatch Center was interrupted for several days. The 1940's model National Guard surplus generator for the Dispatch Center failed. Northern Butte County ranchers experienced heavy livestock loss as a result of this storm. This storm resulted in Presidential Disaster Declaration DR-1647.

May 2008: Heavy snow and ice blanketed the county taking out power for days and closing roads.

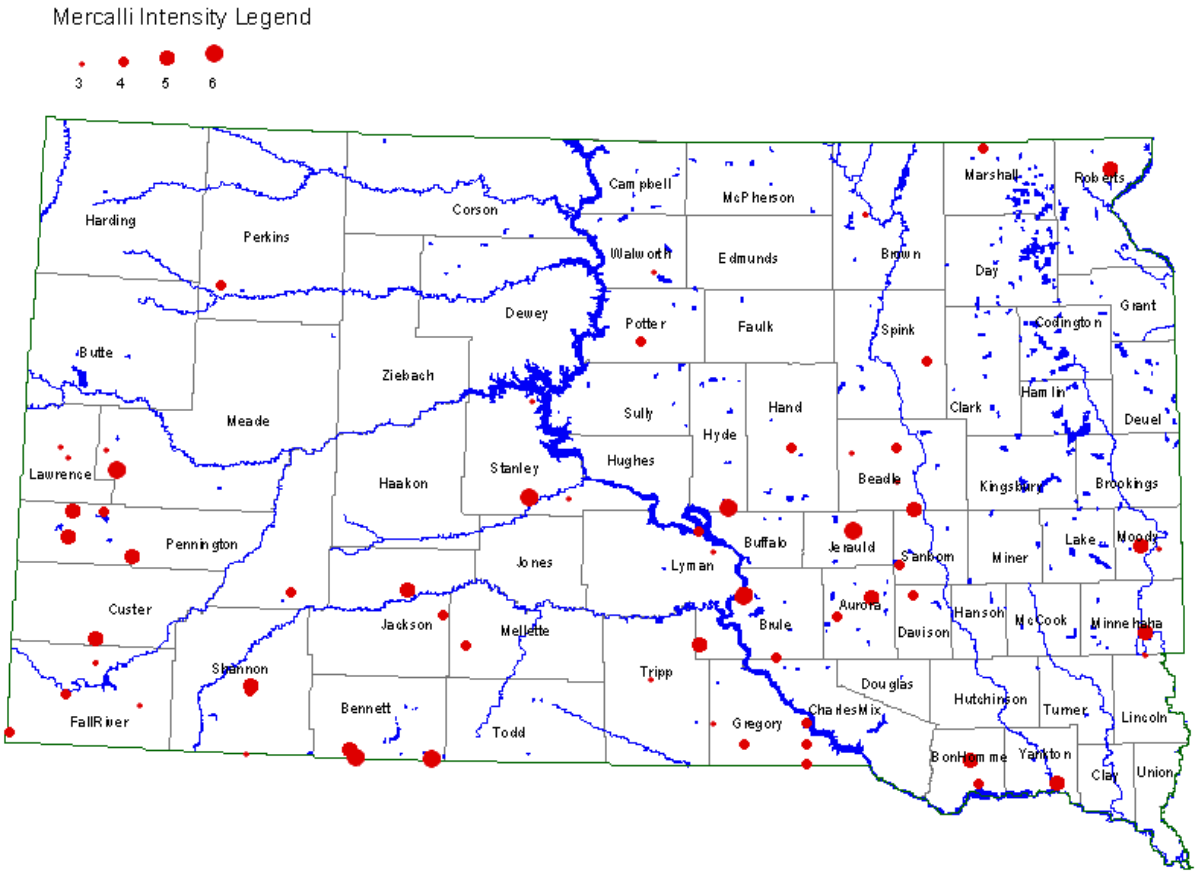
November 2008: An intense fall storm produced blizzard conditions across the South Dakota plains for over 24 hours. Precipitation started as rain on Nov 5 and changed to heavy, wet snow during the evening. Snow and blowing snow continued through much of Nov 6 with visibility near zero much of the time. Snowfall amounts were six to 18 inches with drifts 12 feet high. More than two thousand power poles were downed, causing widespread power outages that affected thousands of residents. Most roads across the area, including Interstate 90, were closed for 24 hours or longer. Deer hunters traveling into Butte County from out of state became stranded on US Highway 212 east of Newell, requiring a two-day rescue operation by County resources to reach them. Many livestock died from hypothermia. Officials estimated total damage around 5 million dollars.

Spring 2009: Three spring blizzards in just two weeks produced record snowfall. The first occurred Mar 23-24. Precipitation started as rain, then changed to snow, and blizzard conditions developed as winds increased. Ten to 20 inches of snow fell across far northwestern South Dakota, with drifts as high as ten feet. Sustained winds of 30 to 55 mph, with gusts over 80 mph, were reported. Interstate 90 and other highways were closed for more than 24 hours. Some power outages were reported, mainly across the northern Black Hills and northwestern South Dakota. A week later, the second blizzard brought heavy snow and strong winds to the western South Dakota plains on Mar 30-31. Northwest wind gusts to 50 mph produced significant blowing and drifting snow, reducing visibilities to near zero for many hours. Reports of six to 12 inches of snow were common, with higher amounts across northwestern South Dakota. Interstate 90 and many other highways were closed for a considerable period of time. The third storm brought heavy snow and gusty winds to western South Dakota. Snowfall amounts ranged from six to 12 inches, with as much as 20 inches in the northern Black Hills. Strong northerly winds produced considerable blowing and drifting snow across the plains, reducing visibility to near zero. Combined snowfall across Butte County ranged from 24 to 36 inches (or two to three feet). Tens of thousands of livestock perished as the storms hit during the peak of calving and lambing season.

Earthquake.

There have been no earthquakes centered in Butte County.

Figure 8 - Earthquakes in South Dakota since 1900



Butte County-area historical earthquake activity is slightly below South Dakota state average. It is 95% smaller than the overall U.S. average.

On Feb 6, 1996 at 16:08:36, a magnitude 3.7 earthquake occurred 53.7 miles away from Butte County center and 47.9 miles away from Belle Fourche city center.

On Feb 7, 2007 at 10:35:58, a magnitude 3.1 earthquake occurred 71.5 miles away from the county center and 76.6 miles away from Belle Fourche city center.

Landslide.

Landslides in Butte County are an infrequent occurrence. There are no documented incidents which caused injury, property damage, or road closures. Most evidence indicates they have occurred in sparsely populated areas in connection with very heavy rain especially in areas where ground cover has been damaged or destroyed by severe drought, fire, livestock grazing, off-road travel or construction. In dry areas in the northern half of the County, freezing and thawing can cause soils and rock to break off the sides of buttes, steep draws and ravines. These "slides" are generally very minor and travel as far as the bottom of the terrain feature which can be as much as 50-75 feet in elevation.

Wildfire.

Butte County produced a Community Wildfire Protection Plan (CWPP) in 2007. The CWPP is included as Section XI, Appendix 4 to this plan. There have been no catastrophic fires in Butte County. However, fires sparked by lightning, agricultural equipment, or other human activity, frequently occur. When pushed by high winds, these fires spread rapidly and aggressive firefighting is required to prevent loss to grazing forage and ranch or farm structures. Many small fires go unreported. Most occur in mid to late summer when grasses and vegetation are dry.

Wildland fires that occurred in Butte County 2003-2009 and were reported to the South Dakota Department of Agriculture, Wildland Fire Suppression Division are shown below.

Table 10 – Wildland Fires in Butte County 2000-2009

Year	Wildland Fires Reported
2003	4
2004	3
2005	1
2006	10
2007	13
2008	0
2009	8

The high number of fires in 2006 and 2007 occurred at the height of the drought in western South Dakota.

Man-Caused Hazards

Hazardous Material Incident. Because of the numerous state highways and the long distances across the county, from time to time hazardous materials accidents have occurred. In fact, all incidents resulting in an unscheduled release of hazardous materials have involved transportation related incidents. None have resulted in deaths due to exposure to hazardous materials, no evacuations of nearby residences have been required, and environmental damage

has been negligible. The largest impacts have been from road closures while the incident was stabilized. None have resulted in long term road closures for cleanup.

Mass Causality Event. There have been no incidents resulting in mass causalities in Butte County. There is potential for mass casualties caused by a natural hazard such as a severe thunderstorm high wind, hail, tornado or hazard such as terrorism, bombing or criminal activity at the Black Hills Roundup Rodeo, which is held each year at the rodeo grounds in Belle Fourche. A natural hazard event is most likely; however, public warning via sirens and public address systems is considered adequate and would be timely. Vulnerability is high because there is only one means if ingress and egress to the rodeo grounds. Past planning for the event has addressed the access issue, including the potential to construct a bridge and road to provide an alternate route on the west side of the grounds. A temporary bridge using Army National Guard bridging materials has also been discussed but no action taken. This is one issue that the planning team recommends for further study by the City and event organizers.

Epidemic. An epidemic such as H1N1 influenza is the most likely scenario. The Spanish flu outbreak following World War I is the largest similar event to compare potential impacts on South Dakota and Butte County. However, in the case of H1N1, preventative vaccines are available. In addition, the state, some counties, and hospitals and healthcare officials have plans to identify and control an outbreak. These plans have information, strategies and recommendations that are applicable to outbreaks of other epidemics.

There is some potential for a livestock epidemic.

Indeed, cases of naturally occurring anthrax happen nearly every year in South Dakota. In August 2008, anthrax was detected in three South Dakota cattle herds in Douglas and Hutchinson counties. Anthrax is primarily an occupational disease. Spores of the anthrax bacteria can live in the soil for many years. Humans may become infected with anthrax by inhaling contaminated soil particles, by contact with infected animal tissue, or by handling wool or hair from diseased animals. There are no reports of spread from human to human. Anthrax can be treated with high doses of antibiotics, although effectiveness may be limited after symptoms are present. All forms of the disease must be treated promptly, and inhalation anthrax is nearly always fatal if not treated before symptoms begin. There is a preventative vaccine available for people in high risk professions such as veterinarians and individuals who work with imported animal hides, furs, wool, bone meal, hair and bristles. Infected animals are usually destroyed and carcasses disposed. Premises are quarantined until cleared by the State veterinarian.

Brucellosis of cattle, also known as "Bangs disease", is a bacterial infection, which can also cause a disease of humans known as "undulant fever". Brucellosis infection of cattle causes abortion or premature calving of recently infected animals, most often between the fifth and eight month of pregnancy. Although federal and state regulations have helped to control this disease, there is still a threat. Consequently, a large number of cattle producers still vaccinate their herds against the disease. The US Department of Agriculture announced in July 2009 that no U.S. cattle herds are known to be infected with brucellosis, and all states are listed as class-free for the disease. However, as long as there's that interaction between brucellosis-positive

wildlife and livestock, there's always the possibility of disease. Currently, brucellosis is known to exist in the Yellowstone bison and elk herds. These animals pose no threat to livestock South Dakota. Because of low risk, it is possible that producers will discontinue active vaccination programs and the disease could resurface in domestic herds. Loss of brucellosis free status in the state could adversely impact the livestock sales and shipments across state lines.

No cases of Bovine spongiform encephalopathy (BSE), commonly known as mad-cow disease have occurred in South Dakota. BSE is a fatal, neurodegenerative disease in cattle. BSE has a long incubation period, about 4 years, usually affecting adult cattle at a peak age onset of four to five years, all breeds being equally susceptible. The disease is caused by cattle being fed the remains of other cattle in the form of meat and bone meal, which causes the infectious agent to spread. Scientists believe the disease may be transmitted to humans who eat the brain or spinal cord of infected carcasses. In humans, it is known as new variant Creutzfeldt–Jakob disease (vCJD or nvCJD). Quarantine of premises with infected animals and destruction of infected herds is effective in controlling the disease. However, incidents of disease discovery in domestic herds can have catastrophic consequences in access to global markets for US beef. This could seriously affect the livestock industry in Butte County.

The planning team believes the low probability of human or livestock epidemics does not warrant special attention in this plan. However, if funding could be secured, the County Emergency Manager might consider a future project to develop a plan, which supplements the State's plan, for identifying, controlling and mitigating such an event in the County.

Terrorism (Chemical, Biological, Nuclear)/Agricultural Terrorism. Not impossible, but unlikely in Butte County. Most likely scenario, but still improbable, would be an incident of agricultural terrorism directed at livestock producers. This could take the form introducing a disease into a herd or personal attacks by radical groups directed at producers and their families. With Federal and State intelligence and law enforcement efforts directed toward preventing incidents and the low probability of an event occurring in Butte County, the planning team considers antiterrorism mitigation planning outside the scope of this effort. However, routine security measures to protect critical infrastructure and vigilance by County residents should be included in existing anticrime education forums and programs. Free agricultural terrorism training materials and the State plan for managing animal disease outbreaks are available through the State Animal Industry Board. The potential for a terrorism event targeting the Black Hills Roundup Rodeo should be addressed as part of the annual event planning.

Aircraft Accident. There are no records of aviation accidents which caused property damage or endangered the residents of Butte County. The County has no major airports. Belle Fourche Municipal Airport is not capable of handling large, multi-passenger aircraft and is not located close to populated areas. However, the proximity of Ellsworth AFB and the Powder River Military Operating Area (MOA), which may expand with a corresponding increase in utilization, provides potential for a future mishap. Generally, the role of Butte County emergency responders to such an event would be to provide life-saving assistance, fire control

and site security until military authorities arrive on scene. With military aircraft, HAZMAT issues are a concern.

Overall, the probability of an aircraft accident affecting Butte County is relatively low when assessed in context of the total safety record of aviation in the United States.

Criminal Activity (Hostage Situation, Bombing, Violence, or Arson). Crime in Butte County and its political jurisdictions is very low.

Table 11 – Butte County Crime Statistics (Butte County Sheriff's Office)

Type	2004	2005
Murders	0	0
Rapes	0	1
Robberies	0	0
Assaults	0	1
Burglaries	0	3
Thefts	9	6
Auto Thefts	2	1

Table 12 – Belle Fourche Crime Statistics (Belle Fourche Police Department)

Type	2002	2003	2005	2006	2008
Murders	1	0	0	0	0
Rapes	3	1	0	2	2
Robberies	1	0	0	0	0
Assaults	0	11	3	1	9
Burglaries	13	14	3	1	15
Thefts	62	69	10	5	42
Auto Thefts	1	2	2	0	3
Arson	1	0	0	0	1
Crime Index*	177.5	152.8	29.3	43.9	129.3

* Higher means more crime. US average = 320.9

The low crime rate in the largest city and in Butte County in general suggests the likelihood of an incident resulting in loss of life or property damage to public or private infrastructure is remote. Law enforcement procedures and protocols are believed sufficient to manage or mitigate criminal activity. Of course, the benefits from active anticrime public education and programs such as Neighborhood Watch should not be overlooked.

Civil Disobedience. The most probable occurrence of civil disobedience would likely involve protests by animal activists against rodeo sports at the annual Black Hills Roundup Rodeo in Belle Fourche Rodeo each July 4th or the Newell Rodeo that takes place each Labor Day. Such demonstrations would not adversely affect the events or the County and would pose only a minor inconvenience to attendees. However, event organizers are encouraged to address such issues during their preplanning.

Disaster Declarations (Experience)

Since 2004 there have been five federal disaster declarations which have included Butte County.

Table 13 – Summary of FEMA Disaster Declarations Since 2004

FEMA Declaration Number	Date of Declaration	Event	Primary Impact
FEMA 1647	5 Jun 2006	Severe Winter Storm	Damage to utilities
FEMA 1759	22 May 2008	Severe Winter Storm and Record and Near Record Snow	Damage to utilities
FEMA 1774	9 Jul 2008	Severe Storms and Flooding	Damage to roads and bridges
FEMA 1811	12 Dec 2008	Severe Winter Storm and Record and Near Record Snow	Damage to public utilities
FEMA 1844	16 Jun 2009	Severe Storms and Flooding	Damage to road systems

Table 14 – Summary of Damage Costs from Disasters Since 2004 (Damage figures provided by Butte County and electrical companies)

Event	Date	County Damage	Cost	Utilities Damage	Cost
Winter Storm (1647)*	Apr 2006			Power Distribution	$1,176,655
Winter Storm (1759)*	May 2008		$15,328.86	Power Distribution	$842,914
Flooding (1774)*	Jun 2008	Roads & Bridges	$580,610.58		
Winter Storm (1811)*	Nov 2008		$115,945.12	Power Distribution	$1,277,090
Flooding (1844)*	Jun 2009	Roads & Bridges	$281,751.04		
Winter Storm	Dec 2009			Power Distribution	$77,400

* FEMA Disaster Declaration Number

Event Probability Assessment

Based on analysis of actual climatological data and past experience with natural disasters in Butte County, as well as a review of law enforcement records and accident reports, the probability of specific natural and man-caused events occurring was determined by the planning team. See Table 15.

Table 15 – Hazard Probability

Event	**Probability**			
	High	Medium	Low	None
Points Assigned	*3*	*2*	*1*	*0*
Natural Event				
Tornado			x	
Thunderstorm	x			
High Wind/Hail	x			
Flood/Flash Flood		x		
Winter Storm/Blizzard	x			
Wildfire			x	
Landslide				x
Earthquake				x
Drought		x		
Dam Failure			x	
Man-Caused Event				
HAZMAT		x		
Mass Casualty			x	
Epidemic			x	
Terrorism - Chemical				x
Terrorism - Biological				x
Terrorism - Nuclear				x
Terrorism - Agricultural			x	
Bombing				x
Hostage/Violence				x
Civil Unrest				x

Event Profiles

Based on the data analyzed for this plan and the events which have occurred in Butte County, the following conclusions were reached:

- Heavy snows with rapid melt or heavy rains can cause rapid onset and/or flash flooding of streams and rivers, particularly those in Belle Fourche River Watershed in Butte County.
- Severe winter storms and blizzards impact Butte County nearly every year. These result in livestock deaths, negatively affecting the agricultural industry and Butte County infrastructure. Loss of electricity is possible with greatly impacts the population.
- Severe weather during the summer regularly produces high straight-line winds, large hail, lightning and occasional tornadoes, which damages crops and livestock, and causes property damage.
- Hazardous Material incidents related to transportation may occur primarily on State and U.S. Highways.

Vulnerability and Exposure

Flooding. Rural infrastructure, particularly gravel road, bridges and culverts, are extremely vulnerable and exposed to flooding damage. Data indicates damage cost is largely associated with rural road repairs, especially rebuilding roadbeds, replacing culverts, repairing rural bridges and bridge approaches. No critical public infrastructure (fire and police stations, government buildings, schools, primary highway bridges, etc.) has been damaged and all such structures, except highway bridges, are located outside high risk areas.

The city of Belle Fourche is vulnerable to flooding with because the Belle Fourche River, Redwater River and Hay Creek all meet inside city limits. Flooding occurs approximately every 10 to 20 years. Key Hole Reservoir in Wyoming would pose a flooding risk to Belle Fourche if the dam fails. FEMA Flood Insurance Rate Maps, included in Section XI, Appendix 5, were used to assess flooding vulnerability in the City of Belle Fourche. These maps are currently under revision. Some structures in Belle Fourche have sustained flood damage in past events. However, a review of records showed no private properties or structures that sustained damage was enrolled in the National Flood Insurance Program. This reveals a need to encourage property owners to participate in the program. The City has designated an individual to manage floodplain development and code enforcement.

Areas downstream of the Belle Fourche Reservoir are vulnerable to severe flooding if Orman Dam fails. Many rural farms and ranches would be affected; however, the town of Nisland is most vulnerable because of its proximity to the Belle Fourche River. See Section XI, Appendix 2, for Orman Dam failure inundation maps.

More could be done to reduce the potential for damage through the use of building codes and zoning to influence structure designs and land use in high risk areas.

Winter Storms and Blizzards. All areas of Butte County are vulnerable to severe snow storms and blizzards. On average, severe snowstorms or blizzards adversely affect the Butte County and local communities about once every 5 years, although in the last five years the County has experienced four significant events. The impact to transportation infrastructure for emergency access is particularly troublesome. The vulnerability of livestock operations to this hazard is also noteworthy. Electrical utilities are exposed and vulnerable with storms causing dangerous and prolonged outages in both community and rural areas. Many critical facilities in the communities now have emergency generators or capability to hook them into critical buildings and some rural residents have generators. In addition, emergency services and commercial communications all have backup generators. However, resupply of fuel for generators is problematic at remote locations.

Thunderstorms, High Winds and Tornados. All individual jurisdictions and residents are vulnerable to severe summer storms, high winds and tornados. Rural homesteads, farms and ranches are generally most affected because of the exposure of facilities, agricultural crops and livestock to these events. However, events and damages they cause tend to be localized due to the smaller footprint of such events. Belle Fourche, Newell, Nisland, Vale and Fruitdale are vulnerable to high winds with significant damage occurring about once every 5 years.

Other Factors. The age of homes in Butte County contributes to greater damage from natural disasters since construction codes and damage-resistant materials were not used or enforced during early periods of development. As new development continues in the County, code enforcement and better construction materials and techniques should reduce damage to property from some natural events.

Table 16 – Age of Homes in Butte County

Year Home Built	Number Constructed
1990 – 1999	490
1980 – 1989	419
1970 – 1979	836
1960 – 1969	405
1950 – 1959	576
1940 – 1949	366
1939 or earlier	919

Generally, costs and fatality/injury data associated with past events provides a strong baseline for identifying damage potential and providing estimates for dealing with and planning for future events.

V. AT RISK

Overview

Risk. Risk depends on the hazard, vulnerability and exposure. It is the estimated impact a hazard would have on people, services, facilities, infrastructure and structures in a community; the type and kind of disruption that may occur. The following impacts and their effects were considered:

- Loss of Emergency Services
- Continuity of Government
- Loss of Essential Services
  - Electrical Failure
  - Natural Gas Failure (including pipeline rupture or supply interruption)
  - Water System Failure
  - Sewer System Failure
  - Communication System Failure
  - Data Systems and Internet Failure
  - Fuel Shortage
- Highway and Highway Infrastructure Failure
- Loss of Public and Private Structures
- Property Loss

Risk Assessment. Risk assessment is the process of measuring the potential loss of life, personal injury, economic impact and property damage resulting from hazards

People

In every community, there is an "at risk" population; the young and elderly are generally at higher risk in an emergency or disaster. They may not receive and understand warning notifications or be able to respond appropriately. They may lack the mental or physical capacity to react to situations which places them in danger. Older citizens often have conditions requiring medical support systems or special care. These populations are affected in a greater magnitude than the other segments of the population due to their age, in some cases income level, and their dependency on others. Risk increases when a catastrophic event results in loss of emergency services and continuity of government or when essential services, such as electricity, natural gas, water and sewer systems, are interrupted for long periods of time.

According to 2008 U.S. Census estimates (Table 2), about 24.3% of the population of Butte County are under 18 years of age (7.2% are under 5 years) and 15.2% of the population is over 62 years of age. This is means that between 22.4% and 39.5% of the population of the county are potentially vulnerable to disruption of the community's infrastructure and services and may require assistance during a disaster. Individuals and families that live below the poverty level

are not included in this total if family members do not fall in the age groups. In addition, those that are disabled, physically or mentally, may not be included. Because many of these categories combine, we can estimate that over a quarter of the population could be considered at increased risk. A list of facilities in Butte County with concentrations of "at risk" elderly populations and schools/facilities with children are included in Table 20.

Agriculture

Experience has shown that each of the weather-related hazards that frequently occur in Butte County has potential to impact agriculture. Livestock losses due to winter storms, crop loss from flooding or high winds and hail, and pasture or hay production losses from wildland fire and drought place agriculture at high risk.

Agriculture is the lynchpin of Butte County's economy. The annual $55.4 million value of agricultural products produced does not address the impact agriculture has on all other sectors of the local economy. For this reason, any event which places agricultural production at risk can have devastating impact on the County and the individual communities.

Infrastructure

Using only events which are assessed as low or greater probability of occurring in Butte County, the infrastructure impacts that are likely to occur were evaluated. The results of this evaluation are summarized in Table 17.

Table 17 – Infrastructure Failure Probability

Event	Electrical Failure	Comm Failure	Data Systems/ Internet Failure	Natural Gas Failure/ Gas Line Rupture	Water System Failure	Sewer System Failure	Highway Infrastructure Failure	Fuel Shortage
Points Assigned	***5***	***5***	***3***	***2***	***5***	***4***	***4***	***1***
Natural Event								
Tornado	x	x	x					
Thunderstorm	x	x	x					
High Wind/Hail	x	x	x					
Flood/Flash Flood	x				x	x	x	
Winter Storm/ Blizzard	x	x	x				x	x
Wildfire								
Drought					x			
Dam Failure							x	
Man-Caused Event								
HAZMAT					x		x	
Mass Casualty								
Epidemic								
Terrorism - Agricultural								

The replacement value of government facilities and highway infrastructure, and their importance, are factors in considering the potential impact of a disaster on Butte County and the jurisdictional subdivisions. These facilities are important in managing response and maintaining the continuity of governmental operations during and after an event. Consequently, any event placing them at risk and potential projects which mitigate loss or damage must be addressed.

The values of structures and infrastructure used in evaluating impacts of hazard events and potential mitigation projects, especially cost-benefit analyses, are shown in the table below. Private valuations in each jurisdiction are shown in Table 5 of the plan.

Table 18 – Government and Public Facility Values

Structure/Facility	Location	Building Value	Contents Value
County/City Government			
Butte County Court House	839 5th Ave., Belle Fourche	$2,482,112	$776,579
Butte County State's Attorney's Office/Extension Office	849 5th Ave., Belle Fourche	$182,624	$31,827
Department of Social Services/GF&P Office	609 5th St., Belle Fourche		
Butte County DOT Office	830 6th Ave., Belle Fourche	$570,115	$31,827
Belle Fourche City Hall	511 6th Ave., Belle Fourche	$1,700,000	$95,000
Newell City Hall	108 3rd St., Newell	$394,695	$18,041
Nisland Town Hall	2nd St., Nisland		
Fruitdale Town Hall			
Law Enforcement/Emergency Services			
Belle Fourche Police Department	1010 8th Ave.	$300,900	$52,500
Butte County Ambulance - Belle Fourche	520 Faulk St.		
Butte County Ambulance - Newell	104 4th St.	$66,549	
Belle Fourche Volunteer Fire Department	603 National St.		
Newell Volunteer Fire Department	102 4th St.	$183,983	$81,338
Nisland-Arpan Volunteer Fire and Rescue Department	404 Second St.		
Vale Volunteer Fire Department	307 Rosander Ave.	140,000	
Castle Rock Volunteer Fire Department	Various	$12,000	$20,000
Communications			
Radio Repeater – Castle Rock	Civil Defense Tower Rd.		
Radio Repeater – Shaykett Hill	US Hwy 212 - West of Nisland		
Belle Fourche City Transmitter	913 Summit St.	$22,800	0
Schools			
North Park Elementary School	29 6th Ave., Belle Fourche		
South Park Elementary School	1816 Valley Dr., Belle Fourche		
Belle Fourche Middle School	1302 Ziebach, Belle Fourche		
Belle Fourche High School	1301 12th St., Belle Fourche		
Belle Fourche Administrative Offices	2305 13th Ave., Belle Fourche		
Alternative School	215 Dakota Ave., Belle Fourche		
Newell Elementary, Middle & High Schools	501 Dartmouth, Newell		
State/County DOT Maintenance Facilities			
State DOT Shop – Belle Fourche	SD Highway 34 - west		
County DOT Shop – Belle Fourche		$162,639	$37,132
State/County DOT Shop – Newell		$108,485	$2,122
County Shop – Nisland	2nd St.	$77,981	$35,222
City Maintenance Facilities			
City of Belle Fourche, Public Works (Shop)	506 Faulk St.	$494,000	$78,700
City Shop – Newell	Rodeo Grounds	$47,322	$27,358

Structure/Facility	Location	Building Value	Contents Value
Community Centers/Shelters			
Belle Fourche Area Community Center	1111 National St.	$6,105,000	$126,000
Belle Fourche Community Hall	508 6th Ave.	$ 654,000	$35,280
Nisland Independent Community Church	US Highway 212		
Vale Community Center	Rosander Ave.		
Castle Rock Community Hall	SD Highway 79		
Water Supply & Distribution, Waste Water Handling & Treatment			
City of Belle Fourche Municipal Water System - Water Storage, Supply, Treatment Facility	10944 Water Tank Rd.	$26,000	$100,500
City of Belle Fourche Municipal Water System - Water Storage, Supply, Treatment Facility	911 Summit St.	$545,200	$10,500
City of Belle Fourche Municipal Water System - Water Storage, Lift Station	19348 Valley View Ln.	$26,500	$ 2,000
City of Belle Fourche, North Water Tank	Water Tank Rd.	$417,000	N/A
City of Belle Fourche, Hat Ranch Water Tank		$275,600	N/A
City of Belle Fourche, Waste Water Lagoon	US Highway 85 & Diversion Dam Rd.	N/A	N/A
City of Newell Municipal Water System - Water Storage Facility	506 4th St.	$6,655	N/A
City of Newell Municipal Water System - Water Tower	402 4th St.	$221,827	N/A
City of Newell, West Well	R9N, T6E, Sec 34 NW 1/4	$4435	N/A
City of Newell, East Well	R9N, T6E, Sec 32	$4435	N/A
Town of Nisland Water System - Well	303 Vine St.		N/A
Town of Nisland Water System - Water Storage Facility	303 Vine St.		N/A
Town of Nisland, Waste Water Lagoon	Whitewood Valley Rd.		N/A
Town of Vale Water System – Well	411 Andrew St.		N/A
Town of Vale Water System – Water Storage Facility	Vale Cemetery Rd. (Meade County)		N/A
Town of Vale, Waste Water Lift Station	Gaskill Rd.		N/A
Town of Vale, Waster Water Lagoon	North of City Park		N/A
Other			
Orman Dam	US Highway 212 - east		N/A
Belle Fourche Diversion Dam	1.5 miles northeast of Belle Fourche		N/A
Black Hills Roundup Grounds		$898,950	$98,750
Butte County Fairgrounds		$1,040,855	$5,305
Belle Fourche Irrigation District Offices & Maintenance Yard	209 Dartmouth Ave.		N/A

Finally, infrastructure considered at elevated risk due to high probability, catastrophic events, is shown in Table 19. Notably, natural gas utilities have not been affected by past events and are excluded from the table. A complete list of infrastructure considered is shown in Section XI, Appendix 3.

Table 19 – Infrastructure Elevated At Risk

Structure/Facility	Location	Severe Storm*	Flood	Blizzard/ Winter Storm	HAZMAT
Communications					
West River Cooperative Telephone Company - Newell Switch Facility				x (1)	
West River Cooperative Telephone Company - Newell Fiber Optic Switch	Behind Newell City Hall			x (1)	
West River Cooperative Telephone Company – Nisland Switch Facility				x (1)	
West River Cooperative Telephone Company – Vale Switch Facility				x (1)	
West River Cooperative Telephone Company – Vale Fiber Optic Switch	East 136th Ave			x (1)	
West River Cooperative Telephone Company – Vale Fiber Optic Switch	West Shuck Rd.			x (1)	
Alltel Cellular Telephone Tower, Belle Fourche				x (1)	
Alltel Cellular Telephone Tower, Newell				x (1)	
Alltel Cellular Telephone Tower, Castle Rock				x (1)	
Verizon Cellular Telephone Tower, Belle Fourche				x (1)	
Verizon Cellular Telephone Tower, Newell				x (1)	
Qwest Switch Facility, Belle Fourche	Railroad St.			x (1)	
KBFS (1450 AM)/KYDT (103.1 FM), Belle Fourche	707 Harding St.	x		x (1)	
Roads & Highways					
US Highway 85				x	x
US Highway 212				x	x
US Highway 34				x	x
SD Highway 79				x	x
SD Highway 168				x	x
Sonoma Rd.-Vale Cut-Off Rd			x	x	
Orman Rd.			x	x	
Whitewood Valley Rd.			x	x	
Cobb Rd.-Lake St.-Fruitdale Ln.			x	x	
Valley Township Rd.			x	x	
Camp Crook Rd.			x	x	
Old Highway 85			x	x	
Twilight Rd.			x	x	
Erk Rd.			x	x	
Hoover-Zeona Rd.			x	x	
Old Highway 212			x	x	
Sourdough Rd., Belle Fourche			x	x	
Helmer Rd., Belle Fourche			x	x	
Wood Rd., Belle Fourche			x	x	

Structure/Facility	Location	Severe Storm*	Flood	Blizzard/ Winter Storm	HAZMAT
Highway Infrastructure					
Belle Fourche River Bridge, Belle Fourche	US Highway 85				x
Belle Fourche River Bridge, Belle Fourche	US Highway 212				x
Belle Fourche River Bridge, Newell	SD Highway 79				x
Belle Fourche River Bridge, Belle Fourche	8th Ave				
Belle Fourche River Bridge, Belle Fourche	Roundup Grounds				
Belle Fourche River Bridge, Fruitdale	Cobb Rd.-Lake St.-Fruitdale Ln.				
Belle Fourche River Bridge, Nisland	Whitewood Valley Rd.				
Belle Fourche River Bridge, Vale (Bismarck Bridge)	US Highway 85 (5th Ave.)				
Hay Creek Bridge, Belle Fourche	8th Ave				
Hay Creek Bridge, Belle Fourche	National St.				
Hay Creek Bridge, Belle Fourche					
Redwater River Bridge, Belle Fourche	US Highway 34				x
Redwater River Bridge, Belle Fourche	Business Highway 212				
Redwater River Bridge, Belle Fourche	Sonoma Rd.				
Horse Creek Bridge, Newell	SD Highway 79				x
Cottonwood Creek Bridge, Vale	US Highway 79				x
Cottonwood Creek Bridge, Vale	Valley Township Road				
Owl Creek Bridge	US Highway 212				x
Electric Distribution					
Butte Electric Cooperative Distribution Lines	Various			x	
Black Hills Power Distribution Lines	Various			x	

* - Includes tornado, thunderstorm, high winds and hail.

Notes:

(1) Risk from loss of electrical power and inability to refuel emergency generators due to accessibility

Residential Subdivisions

Nearly all residential and commercial subdivisions are at some risk of damage from severe storms and damaging wind events because of their exposure and construction. Similarly, most residential and commercial areas will lose electrical power when distribution infrastructure is destroyed by winter storms. However, some subdivisions are assessed at higher risk due to special considerations, such as trailer parks. In addition some subdivisions are known to be subject to flooding or are routinely isolated by winter storms. And, due to proximity to highways, some areas are at higher risk from a transportation accident involving HAZMAT cargos. These subdivisions are identified in the table below. Inclusion in the table places them at higher priority for awareness programs or other similar mitigation measures. Section XI, Appendix 3 contains a complete list of residential subdivisions in Butte County jurisdictions and Appendix 6 shows a map of the City of Belle Fourche subdivisions.

Table 20 – Subdivisions and People At Risk

Subdivision	Locations Affected	Severe Storm*	Flood	Blizzard/ Winter Storm	HAZMAT
Mobile Homes – Belle Fourche					
Tipperary		x			
Cleveland		x			
Horseshoe		x			
Hillsview		x			
Oak Valley	US Hwy212.	x			x
Plainsview		x			
Shady Lanes		x			
Southside	US Hwy 85	x			x
Mobile Homes – Rural Belle Fourche					
Cottonwood		x			
Riverside		x			
Rolling Hills		x			
Wagon Wheel		x			
Mobile Homes - Newell					
Prairie Vista		x			
Mobile Homes - Nisland					
Hartland		x			
Elderly Residents – Belle Fourche					
Sunpointe Regional Senior Care	2200 13th Ave.	x		x	
Judy's Assisted Living Center	1308 Sundance Circle	x		x	
Country Place Senior Living		x		x	
Cheyenne Palms Assisted Living		x		x	
John Burn's Apartments	430 Oriole Dr.	x		x	
High Prairie Retirement Home	19129 Prairie Hills Rd.	x		x	
Elderly Residents - Newell					
Grand Valley Apartments	505 Girard Ave.	x		x	
Green Valley Apartments	113 Girard Ave.	x		x	
Newell Townhouses	120 8th St.	x		x	

Subdivision	Locations Affected	Severe Storm*	Flood	Blizzard/ Winter Storm	HAZMAT
Schools					
North Park Elementary School	29 6th Ave., Belle Fourche	x		x	
South Park Elementary School	1816 Valley Dr., Belle Fourche	x		x	x
Belle Fourche Middle School	1302 Ziebach, Belle Fourche	xx		x	
Belle Fourche High School	1301 12th St., Belle Fourche			x	
Belle Fourche Education connection (Alternative School)	215 Dakota Ave., Belle Fourche	x		x	
Newell Elementary, Middle & High Schools	501 Dartmouth, Newell	x		x	
Day Care, Pre-School					
Bright Beginnings	907 State St. Belle Fourche	x		x	
Badlands Headstart	319 Summit St., Belle Fourche	x		x	
Kiddy Patch Preschool	601 State St., Belle Fourche	x		x	
TREC/Badlands Headstart	101 5th Ave., Belle Fourche	x		x	
Badlands EHS Social Site	618 Dartmouth Ave., Newell	x		x	x
Bev's Day Care	12477 US Hwy 212, Nisland	x		x	x
Residential Subdivisions– Belle Fourche					
Original Belle Fourche	US Hwy 85				x
Belle View	Riverside Dr. (east),Edmunds St., Faulk St., 8th Ave., 9th Ave., 10th Ave.		x		
Busfield #1	US Hwy 212				x
Busfield #2	US Hwy 212				x
Busfield #3	US Hwy 212				x
Country Club	US Hwy 85, SD Hwy 34				x
Country Club Estates	US Hwy 85				x
Crafts 1st	Elkhorn St., Dewey Dr., 10th Ave., 11th Ave.		x		
Outlots to Crafts 1st	Dewey Dr., 10th Ave., 11th Ave.		x		
Crafts 2nd	Kingsbury St., King St., Creek St., 6th Ave, 8th Ave.,10th Ave., Herrmann Park		x		
Eaton Subdivision #1	SD Hwy 34				x
Gay Park	US Hwy 212				x
Hay Creek	US Hwy 85				x
Mountain View	US Hwy 85				x
Northgate	US Hwy 85				x
North Park	US Hwy 85, US Hwy 212				x
Olivers 1st	US Hwy 85, US Hwy 212				x
Park	State St., Harding St. (east), 10th Ave., 11th Ave.		x		
Pineslope	SD Hwy 34				x
Pineview	US Hwy 85				x
Prairie View	US Hwy 85, US Hwy 212				x
Sherrill	US Hwy 85, SF Hwy 34				x
South Park #2	National St., 7th Ave.; US Hwy 85		x		x
Oak Valley	US Hwy 212				x
Dakota	US Hwy 85, SD Hwy 34				x
Moser	US Hwy 85				x
Rosales	US Hwy 85				x
Wells	Mill St.; US Hwy 85		x		x
Lensegrav	US Hwy 85				x
West Belle Addition	SD Hwy 34				x
Phillips Addition	Harding St. (east),		x		
Prairie Hills Ranchettes #3	US Hwy 85				x

Subdivision	Locations Affected	Severe Storm*	Flood	Blizzard/ Winter Storm	HAZMAT
Hat Ranch Addition	US Hwy 85				x
Hat Ranch #2	SD Hwy 34				x
Drolc Addition	US Hwy 85				x
Redwater Ranchettes	US Hwy 85				x
Rolling Hills Subdivision	US Hwy 85				x
Residential Subdivisions– Rural					
Willow Fork Estates	US Hwy 85				x
Bush Subdivision	SD Hwy 34				x
Persche	US Hwy 85				x
Pleasant Acres	US Hwy 85				x
Redwater Ranchettes #2	SD Hwy 34				x
Redwater Ranchettes #3	US Hwy 85				x
Windy Flats	SD Hwy 34				x
Residential Subdivisions– Newell					
City of Newell	US Hwy 212, SD Hwy 79	x			x
Fairview Heights	US Hwy 212, SD Hwy 79	x			x
South Addition	US Hwy 212, SD Hwy 79	x			x
Residential Subdivisions– Nisland					
Town of Nisland	US Hwy 212	x		x	x
Garden Lanes		x		x	x
Residential Subdivisions– Fruitdale					
Town of Fruitdale	44°40′25″N, 103°33′11″W	x		x	
Stearns	US Hwy 212, Fruitdale Ln.	x		x	x
Residential Subdivisions– Rural					
Town of Vale	Valley Township Rd	x		x	x
Town of Castle Rock	SD Hwy 79, SD Hwy 168	x		x	x
Town of Hoover	SD Hwy 79	x		x	x

* - Includes tornado, thunderstorm, high winds and hail.

Commercial Values

Like subdivisions, most commercial businesses are at some risk from severe storms. However, in rural communities, the impact of loosing essential food and fuel services, places them at increased risk. Those values which are important to these communities are listed below. The absence of facilities in Belle Fourche does not imply that they are less important to the local residents or at less risk than those in Newell. Since there are more such facilities, they are not listed here because the likelihood of losing all similar services is lower where more similar services exist. A complete list of commercial values which was assessed in the planning process is found in Section XI, Attachment 3.

Table 21 – Commercial Facilities and Infrastructure Elevated At Risk

Structure/Facility	Severe Storm*	Flood	Blizzard/ Winter Storm	HAZMAT
Commercial Services - Newell				
Grocery Stores				
Newell Grocery			x (1)	
Food Service				
TJ's			x (1)	x (2)
Blue Line Café			x (1)	x (2)
Convenience Stores (Food & Fuel)				
Newell Conoco			x (1)	x (2)
Newell Sinclair			x (1)	x (2)
Lodging				
Newell Hotel			x (1)	
Commercial Services - Nisland				
Food Service				
Nisland Bar			x (1)	
Burnt Toast Café			x (1)	x (2)
Commercial Services - Vale				
Food Service				
Last Call Bar (Old School Gym)			x (1)	
Vale Café			x (1)	

* - Includes tornado, thunderstorm, high winds and hail.

Notes:

(1) Risk from loss of electrical power and no emergency generator.
(2) Proximity to highways where HAZMAT cargos routinely transit.

Assessing Risk

Considering the "At Risk" segments of Butte County and the individual jurisdictions (People, Agriculture, Infrastructure, Residential Subdivisions, and Commercial Values) the planning team, with input from the public meetings, evaluated the potential loss of life, personal injury, economic impact, property damage, and level of disruption resulting from hazards.

Table 22 – Risk/Disruption Table

Event										
	Life	Health/ Safety	Physical Infrastructure	Economic	Agriculture	Private Property	High Disruption	Medium Disruption	Low Disruption	No Disruption
Points Assigned	***5***	***4***	***3***	***2***	***2***	***1***	***3***	***2***	***1***	***0***
Natural Event										
Tornado	x	x	x		x	x			x	
Thunderstorm		x			x	x		x		
High Wind/Hail					x	x		x		
Flood/Flash Flood		x	x	x	x			x		
Winter Storm/ Blizzard	x	x	x	x	x		x			
Wildfire					x	x				x
Drought				x	x		x			
Dam Failure							x			
Man-Caused Event										
HAZMAT	x	x						x		
Mass Casualty		x							x	
Epidemic		x		x				x		
Terrorism - Agricultural				x	x			x		

VI. PAST AND CURRENT MITIGATION ACTIVITIES

Butte County and the individual jurisdictions in the County have many completed and ongoing initiatives which improve and promote mitigation of the affects of natural and man-caused disasters. Many of the activities listed do not directly address specific hazards or vulnerabilities. What they did accomplish, however, is to enable the jurisdictions to improve public warning, manage emergency response, facilitate recovery, and lessen impact of events on the residents and the local economy. While there are few physical projects that avert or reduce actual damage from specific hazards, the activities enumerated directly contribute to the goals of pre-disaster mitigation underlying this plan.

Butte County

- Annual updating of County All-Hazard Plan known as the Butte County Emergency Operation Plan.
- County compliance with all FEMA and SD Office of Emergency Management planning efforts.
- Annual emergency exercises held to test emergency response plans.
- Ongoing training of first responders through the individual agencies.
- Adherence to state certification requirements for communication dispatch, law enforcement, emergency medical services, and firefighting.
- Active Local Emergency Planning Committee
- Developed a Hazardous Materials Plan and commodity flow study.
- County assistance to residents, small businesses, farmers and ranchers through disaster declaration process in response to recent natural disasters.
- Participation on part of the County in statewide digital radio system upgrades to insure communication interoperability.
- Butte County Planning Commission works to provide guidance in building construction, subdivision development, and flood plain issues.
- Participate in County Mutual Aid Agreements with other counties to reduce response and recovery costs in an emergency or disaster.
- Ongoing work to digitalization of local government communication and records infrastructure.
- Partner with Bureau of Reclamation in dam safety plans and exercise program for Key Hole Dam and Orman Dam.
- NOAA Weather Radio
- Development of Butte County Community Wildfire Protection Plan.
- Update to the Butte County Pre-Disaster Mitigation Plan.
- Ongoing training in the National Incident Command System in the County.
- American Red Cross Shelter Manager training
- Annual NWS Weather Spotter training

City of Belle Fourche

- Belle Fourche Volunteer Fire Department is enhancing their capabilities through apparatus acquisition, training and community mitigation activities.
    - All firefighters are trained and certified to State standards within two years of joining the Department.
    - The Department has established a Search and Rescue capability.
    - All members complete ICS 100, 200, 700 and 800 courses and officers receive ICS 300 and 400 level training.
    - Secured new tender with federal grant assistance.
    - Upgraded three type 6 wildland engines
    - Purchased a portable fire retardant-gel system
    - Obtained new SCBA equipment from a BLM grant
- The ambulance service purchased a new ambulance in 2006 and an intercept rig in 2008.
- A new facility has been purchased for the ambulance service.
- The City is working on infrastructure upgrades to streets, sanitation and drainage.
    - A concrete barrier has been erected around the sewage lift station.
    - Changed gate valves at 4th and Edmunds to improve drainage and prevent backflow from the Belle Fourche River into residential areas.
    - The US Highway 85 expansion project includes river bank stabilization.
    - A project to update the floodplain maps is in progress.
    - The City has designated an individual to manage floodplain development and code enforcement.
- City has designated, funded and equipped an Emergency Shelter at the Area Community Center. The shelter has been activated during recent disaster events.
- The Middle School is a designated storm shelter.

City of Newell

- Emergency warning siren has been upgraded.
- Newell Volunteer Fire Department has improved capabilities through engine and equipment purchases and training.
    - Added 1500 gallon water tender.
    - Received $100,000 grant for 30 sets of bunker gear and 5 additional SCBAs.
    - Conducted ICS and annual wildland fire refresher training for department personnel.
- Ambulance service has secured funding for facility upgrade.
- Fire Hall and Ambulance facility have been wired for emergency power and generators are in place.
- Community has completed electrical modifications for emergency generator hook up and stockpiled shelter supplies for a public shelter at Newell High School.
- The basement of the Catholic Church can be used as a public storm shelter.

- Newell has developed and implemented a comprehensive and effective snow removal plan.

Town of Nisland

- Completed an upgrade to flush hydrants and water lines to them.
- Nisland-Apran Volunteer Fire and Rescue Department has enhanced their capabilities through additional training and equipment purchases.
    - All firefighters are trained and certified to State standards within two years of joining the Department
    - The Department has established a Search and Rescue capability.
    - All members complete ICS 100, 200, 700 and 800 courses and officers receive ICS 300 and 400 level training.
    - Received grant for $55,000 for digital radios and communication equipment upgrades
    - Received grant for $86,000 for personal protective clothing and SCBAs.
- Completed installation of new waste water lagoons within the jurisdiction.
- Developing and equipping an Emergency Shelter to support local residents and stranded travelers during emergency and natural disaster events.

Town of Vale

- Vale Volunteer Fire Department is upgrading equipment, communications and emergency response capabilities.
- All Fire Department members complete ICS 100, 200, 700 and 800 courses and officers receive ICS 300 and 400 level training.
- Set up and equipped an Emergency Shelter to support local residents during emergency and natural disaster events. Electrical modifications for emergency power are complete and a generator is in place.

VIII. MITIGATION PROJECTS

Decision Process

After studying and analyzing past, current and proposed mitigation projects, a project decision matrix was developed and used to aid selection and prioritization of future projects.

Using values assigned to natural and man-caused events in the Hazard Probability Table (see Table 15) and the Risk/Disruption Table (see Table 22) as a baseline, a weighted factor resulting from multiplying probably and risk factors indicates the importance of addressing these hazards in developing and prioritizing mitigation projects. This is the Hazard Importance Index. The relative values derived from the Infrastructure Failure Table (see Table 17) further aids in assigning priorities to specific projects which might reduce damage and or impact of the identified hazard. The end result is a metric-based process that guided decisions made to select specific projects in each jurisdiction based on the probability of an event occurring, the risk of an event to people and property, and the potential damage to infrastructure.

Table 23 – Project Decision Table

Natural Event	Hazard Probability	Risk	Hazard Importance Index	Infrastructure Impact
Tornado	1	16	**16**	13
Thunderstorm	3	9	**27**	13
High Wind/Hail	3	5	**15**	13
Flood/Flash Flood	2	13	**26**	18
Winter Storm/Blizzard	3	19	**81**	18
Wildfire	1	3	**3**	0
Drought	2	7	**14**	5
Dam Failure	1	3	**3**	4
Man-Caused Event				
HAZMAT	2	11	**22**	9
Mass Casualty	1	5	**6**	0
Epidemic	1	8	**8**	0
Terrorism - Agricultural	1	6	**6**	0

In addition, before a project was approved for incorporation in the plan, it was evaluated according to an accepted set of criteria to determine its acceptability, feasibility, cost effectiveness and environmental impact.

For example, in discussions concerning a HAZMAT incident, construction of a truck by-pass to route hazardous cargo transiting US Highway 85 around the west side of Belle Fourche was studied as a potential mitigation project. Using the Project Decision Matrix, HAZMAT places high on the Hazard Importance Index and Infrastructure Impact scale, making it important for

mitigation project consideration. However, when evaluating the project against acceptability and feasibility criteria (See Table 24), it became unacceptable both politically and publically because economic concerns that routine/transient traffic would use the new route and by-pass businesses in Belle Fourche were greater than assessed probability of an accident. Consequently, this project was not included.

Table 24 – Project Acceptability and Feasibility Summary

Project	Jurisdictional Authority	Politically Acceptable	Publically Acceptable	Technically Possible	Cost Effective	Environmentally Safe
Truck By-Pass	Y	N	N	Y	Y	Y

This process was applied to all potential mitigation projects. The end result is the projects recommended for Butte County, Belle Fourche, Newell, Nisland, Fruitdale, and Vale which are incorporated in the plan.

Community Education and Preparedness

The inherent value of public education and preparedness in mitigating the affects of incidents on private and commercial sectors is difficult to quantify. However, one factor important to reducing the impact of disaster events on people and the workload on emergency responders that was identified early in the planning process is the importance of individual preparedness. Appendix 7 to this plan includes educational publications which can be used to improve awareness and aid people in preparing for the most likely events which will affect them. These materials can be used as the basis of any County or local preparedness program.

Mitigation Projects - Butte County

Table 25 – Butte County Project Applicability to Identified Hazards

Natural Event	Public Warning Systems	Emergency Response	Community Preparedness	Dispatch Upgrades
Tornado	Y	Y	Y	Y
Thunderstorm	Y	Y	Y	Y
High Wind/Hail	Y	Y	Y	Y
Flood/Flash Flood	Y	Y	Y	Y
Winter Storm/Blizzard	Y	Y	Y	Y
Wildfire	Y	Y	Y	Y
Drought	N	N	N	N
Dam Failure	Y	Y	Y	Y
Man-Caused Event				
HAZMAT	Y	Y	Y	Y
Mass Casualty	Y	Y	Y	Y
Epidemic	Y	Y	Y	Y
Terrorism - Agricultural	Y	Y	Y	Y

Table 26 – Butte County Project Acceptability and Feasibility Summary

Project	Jurisdictional Authority	Politically Acceptable	Publically Acceptable	Technically Possible	Cost Effective	Environmentally Safe
Public Warning Systems	Y	Y	Y	Y	Y	Y
Emergency Response	Y	Y	Y	Y	Y	Y
Community Preparedness	Y	Y	Y	Y	Y	Y
Dispatch Upgrades	Y	Y	Y	Y	Y	Y

Project 1: **Continue upgrades to county warning and emergency notification systems, communications, flood gauges, backup power generators for critical facilities and other emergency response needs.**

Activities:

- Seek community participation in planning process
- Identify communication and warning system needs
- Identify emergency power requirements
- Evaluate and incorporate new technologies that enhance warning capability
- Evaluate need for flood gauges on other streams
- Continue partnership with Power Companies and Rural Electric Cooperatives to ensure power grid integrity and security.
- Continue partnership with National Weather Service and Weather Radio promotion.

- Ensure all emergency response agencies are equipped with compatible analog and digital communications equipment for interagency operability.

Resources:

- US Geological Service
- National Weather Service
- SD Office of Emergency Management
- Butte County/Butte County Local Emergency Planning Committee
- DHS
- FEMA

Status: ***PROJECT IS OPEN***

- Butte County has added a warning system/siren at Rocky Point/Orman Dam.
- Portable emergency generators have been purchased and provided to Newell Volunteer Fire Department, Nisland-Arpan Volunteer Fire and Rescue Department, and Vale Volunteer Fire Department for use in local shelters.
- The emergency power generator for the County Courthouse has been upgraded. The old generator has been made available for the emergency shelter at the Belle Fourche Area Community Center.
- An uninterrupted power supply has been installed in the County Dispatch Center to provide uninterrupted dispatch functions and communications during emergency power transfer.

Project 2: **Enhance emergency response capabilities by integrating the Incident Command System (ICS) through training, equipment, and planning.**

Activities:

- Build consensus and cooperation between emergency response and local governmental entities.
- Ensure organizational plans address ICS training and equipment issues
- Develop emergency response protocols that integrate ICS management structures.
- Access resources and funding for training, equipment acquisition and planning.

Resources:

- Individual agency training programs
- Butte County LEPC/Butte County Emergency Management
- State Wildland Fire Suppression
- State Fire Marshall's Office
- South Dakota OEM training programs
- FEMA training programs
- DHS programs

Status: ***PROJECT IS OPEN***

- The Butte County Commission has adopted a policy for each emergency agency to attend ICS training. A minimum 85% of emergency responders in each agency are to be trained in basic ICS principles. County Commissioners have attended ICS-100, 200 and 700 courses.
- Emergency exercises evaluate adherence to ICS principles and management structures.

Project 3: **Improve Community Preparedness**

Activities:

- Seek community involvement in the emergency planning process
- Develop and implement community education programs
- Identify projects that promote and improve emergency preparedness
- Identify resources and support for projects

Resources:

- Butte County residents, private organizations and clubs
- Butte School Districts and teachers
- Butte County Emergency Management
- Butte County LEPC
- SD OEM
- FEMA
- DHS

Status: ***PROJECT IS OPEN***

- Public meetings for Pre-Disaster Mitigation have created several initiatives in local communities to prepare for and improve local response to catastrophic events and emergencies.

Project 4: **Continue upgrade of Public Safety Dispatch facility to comply with Federal 911 mandates.**

Activities:

- Seek community support in improvement and upgrade process
- Identify required upgrades.
- Evaluate and incorporate new technologies that meet requirements.
- Identify resources and support for project.
- Prepare and implement narrowband communications conversion plan.

Resources:

- Law Enforcement Grants
- DPS Grants
- Governor's Office of Economic Development
- DHS

Status: ***PROJECT IS OPEN***:

- County Dispatch Center computer and communications systems have been upgraded to meet current E911 standards.
- New computer aided dispatch software has been installed and databases are being updated and improved.
- Identifying equipment upgrades and seeking funding for narrowband communications conversion.

Mitigation Projects - Belle Fourche

Table 27 – Belle Fourche Project Applicability to Identified Hazards

Natural Event	Reduce Flood Damage	Public Warning Systems
Tornado	N	Y
Thunderstorm	Y	Y
High Wind/Hail	N	Y
Flood/Flash Flood	Y	Y
Winter Storm/Blizzard	Y	Y
Wildfire	N	Y
Drought	N	N
Dam Failure	Y	Y
Man-Caused Event		
HAZMAT		Y
Mass Casualty	N	Y
Epidemic	N	Y
Terrorism - Agricultural	N	Y

Table 28 – Belle Fourche Project Acceptability and Feasibility Summary

Project	Jurisdictional Authority	Politically Acceptable	Publically Acceptable	Technically Possible	Cost Effective	Environmentally Safe
Reduce Flood Damage	Y	Y	Y	Y	Y	Y
Public Warning Systems	Y	Y	Y	Y	Y	Y

Project 1: Prevent or reduce flash flooding and flood damage.

Activities:

- Identify and evaluate potential hazards.
- Develop specific mitigation strategies and projects
- Seek funding mechanisms to implement recommend projects
- Actively participate in FEMA DFIRM remapping project
- Apply for FEMA for Pre-Disaster Mitigation funds to mitigate hazards
- Develop and implement reasonable codes and guidelines for floodplain management
- Evaluate projects to deepen the creek bed and increase culvert size to reduce residential flooding along Willow Creek within the city limits
- Encourage residents in “At Risk” areas to participate in the FEMA National Flood Insurance Program.

Resources:

- FEMA
- SD Office of Emergency Management
- Community Development Block Grant
- USDA Rural Development Loan Program
- Municipal bonds

Status: ***PROJECT IS OPEN***

- The City has erected a concrete barrier to protect their sewage lift station from damage from flooding
- Changed gate valves at 4th and Edmunds to improve drainage and prevent backflow from the Belle Fourche River into residential areas.
- The US Highway 85 expansion project includes river bank stabilization.
- A project to update the floodplain maps is in progress.
- The City sent an engineer to training for floodplain management and code enforcement. This will permit a more proactive approach in controlling development and preventing damage from local flooding along the Belle Fourche and Redwater Rivers

Project 2: **Continue to upgrades and enhancements to warning systems.**

Activities:

- Continue partnership with Butte County
- Evaluate siren system for City given recent growth of residential areas and expand system as needed.
- Continue partnership with National Weather Service and promote Weather Radio purchase and use.

Resources:

- US Geological Service
- National Weather Service
- Butte County/Butte County Emergency Management
- SD Office of Emergency Management
- Butte County LEPC

Status: ***PROJECT IS OPEN***

- City of Belle Fourche installed a new siren system on Sourdough Road improving coverage on the west side of the city.

Mitigation Projects - City of Newell

Table 29 – Newell Project Applicability to Identified Hazards

Natural Event	Emergency Response	Manage Emergencies	Emergency Service Facility
Tornado	Y	Y	Y
Thunderstorm	Y	Y	Y
High Wind/Hail	Y	Y	Y
Flood/Flash Flood	Y	Y	Y
Winter Storm/Blizzard	Y	Y	Y
Wildfire	Y	Y	Y
Drought	N	N	N
Dam Failure	Y	Y	Y
Man-Caused Event			
HAZMAT	Y	Y	Y
Mass Casualty	Y	Y	Y
Epidemic	Y	Y	Y
Terrorism - Agricultural	N	Y	N

Table 30 – Newell Project Acceptability and Feasibility Summary

Project	Jurisdictional Authority	Politically Acceptable	Publically Acceptable	Technically Possible	Cost Effective	Environmentally Safe
Emergency Response	Y	Y	Y	Y	Y	Y
Manage Emergencies	Y	Y	Y	Y	Y	Y
Emergency Service Facility	Y	Y	Y	Y	Y	Y

Project 1: Improve fire and EMS unit response in rural areas.

Activities:

- Enhance the fire department's capabilities through equipment acquisition, equipment upgrade and training
- Encourage community support for the fire department improvement initiatives through community education and awareness programs
- Upgrade/Update communications to meet federal narrow-banding requirements

Resources:

- SD Fire Marshall's Office
- SD Wildland Fire
- FEMA Funding

Status: ***PROJECT IS OPEN***

- Newell Volunteer Fire and Rescue Department has improved capabilities through engine and equipment purchases and training. They have added a 1500-gallon water tender and are upgrading an older unit. They received $100,000 grant for 30 sets of bunker gear and 5 additional SCBAs. They conduct annual wildland fire refresher training for department personnel.

Project 2: **Improve capability to manage local emergencies.**

Activities:

- Provide emergency power for City Hall.
- Provide city officials and employees with training in the Incident Command System.
- Develop "At Risk" list of local residents.
- Conduct community disaster education programs.

Resources:

- Butte County
- SD Office of Emergency Management
- Other state and federal grants and loans

Status: ***PROJECT IS OPEN***

Project 3: **Construct a new emergency services facility, combining fire and ambulance service in one building.**

Activities:

- Seek community support for Fire/Ambulance building
- Design facility which meets projected needs and forecasted growth
- Identify possible partnerships and funding sources

Resources:

- Community Development Block Grants
- Rural Development programs
- Other state and federal grants and loans

Status: ***PROJECT IS OPEN***

- City owns sufficient land to construct facility.

Mitigation Projects - Nisland

Table 31 – Nisland Project Applicability to Identified Hazards

Natural Event	Fire Hall	Shelters	Public Warning Systems
Tornado	Y	Y	Y
Thunderstorm	Y	Y	Y
High Wind/Hail	Y	Y	Y
Flood/Flash Flood	Y	Y	Y
Winter Storm/Blizzard	Y	Y	Y
Wildfire	Y	Y	Y
Drought	N	N	N
Dam Failure	Y	Y	Y
Man-Caused Event			
HAZMAT	Y	Y	Y
Mass Casualty	Y	N	Y
Epidemic	Y	N	Y
Terrorism - Agricultural	Y	N	Y

Table 32 – Nisland Project Acceptability and Feasibility Summary

Project	Jurisdictional Authority	Politically Acceptable	Publically Acceptable	Technically Possible	Cost Effective	Environmentally Safe
Fire Hall	Y	Y	Y	Y	Y	Y
Shelters	Y	Y	Y	Y	Y	Y
Public Warning Systems	Y	Y	Y	Y	Y	Y

Project 1: Build a new, larger Fire Hall and a permanent structure for the City Hall possibly a combined use building.

Activities:

- Seek community support for building a new Fire Hall/City Hall
- Identify possible partnerships and funding sources

Resources:

- Community Development Block Grants
- Rural Development programs
- Other state and federal grants and loans

Status: ***PROJECT IS OPEN***

- This project was ranked as the number 2 project for Nisland in the previous Plan. Because of new additional responsibilities assumed by the volunteer fire department and equipment acquisitions, it has become a higher priority for the town.
- Nisland-Arpan Fire and Rescue purchased land for a new fire hall in 2009 and submitted a grant request for fire hall construction funding in the 2009 federal DHS cycle. The design stage for a new hall is complete.
- The town has relocated city offices to a permanent structure leased from the Nisland American Legion Post. They renovated the office space and upgraded the facility. This is a temporary solution. Design, funding, and construction of a more modern facility remain a priority.

Project 2: **Establish Emergency Shelters in the Towns of Nisland and Fruitdale**

Activities:

- Continue partnership with Butte County
- Evaluate facilities within the towns and seek funding for building modifications, equipment and supplies
- Partner with the American Red Cross for developing shelter agreements, training shelter managers, and obtaining shelter supplies

Resources:

- Butte County
- SD Office of Emergency Management
- American Red Cross
- Butte County LEPC

Status: ***PROJECT IS OPEN***

- Recent experience with winter storms has identified need for sheltering facilities in Nisland to accommodate local residents and stranded travelers on US Highway 212 until roads can be opened and electrical service can be restored. In addition, elderly residents with medical issues can be better supported through a central location rather than at individual residences in the area.
- Nisland Independent Community Church adjacent to the highway has been selected and the Town is working with the Church to install wiring to support an emergency power generator. Butte County Emergency Management has provided the Nisland-Arpan Fire and Rescue Department a generator sufficient to meet emergency electrical requirements and necessary supplies to operate the shelter. Seeking funding for permanent generator.
- The town of Fruitdale is evaluating their Town Hall as a potential facility to house local residents. They will require some electrical modifications, a generator and supplies. Water and sanitation issues must be addressed.

Project 3: **Continue to seek upgrades and enhancements to Warning Systems including; sirens, and other systems.**

Activities:

- Continue partnership with Butte County
- Evaluate siren system for Fruitdale and seek funding
- Partner with National Weather Service and promote Weather Radio purchase and use.

Resources:

- National Weather Service
- Butte County
- SD Office of Emergency Management
- Butte County LEPC

Status: ***PROJECT IS OPEN***

- Through partnership with Butte County, the siren system at the Fire Hall has been upgraded in Nisland and a new warning system was installed at Rocky Point State Recreation at the Belle Fourche Reservoir (Orman Dam). However, neither warning system can be heard in the town of Fruitdale, which sits at a lower elevation in the Belle Fourche River Valley south of the reservoir and west of Nisland.
- Many Fruitdale town residents do have NOAA weather radios; however, the requirement for a public system in the town remains a priority.

Mitigation Projects - Vale

Table 33 – Vale Project Applicability to Identified Hazards

Natural Event	Fire Hall Addition
Tornado	Y
Thunderstorm	Y
High Wind/Hail	Y
Flood/Flash Flood	Y
Winter Storm/Blizzard	Y
Wildfire	Y
Drought	N
Dam Failure	Y
Man-Caused Event	
HAZMAT	Y
Mass Casualty	Y
Epidemic	Y
Terrorism - Agricultural	Y

Table 34 – Vale Project Acceptability and Feasibility Summary

Project	Jurisdictional Authority	Politically Acceptable	Publically Acceptable	Technically Possible	Cost Effective	Environmentally Safe
Fire Hall Addition	Y	Y	Y	Y	Y	Y

Project 1: Add Fire Hall addition to house additional fire apparatus and provide underground storm shelter for local residents.

Activities:

- Seek community support for building a new Fire Hall/City Hall addition
- Identify possible partnerships and funding sources

Resources:

- Community Development Block Grants
- Rural Development programs
- Other state and federal grants and loans

Status: ***PROJECT IS OPEN***

IX. ACRONYMS AND ABBREVIATIONS

BFC	Belle Fourche Municipal Airport
BLM	Bureau of Land Management
BOR	Bureau of Reclamation
BSE	Bovine Spongiform Encephalopathy
CWPP	Community Wildfire Protection Plan
DFIRM	
DM&E	Dakota, Minnesota and Eastern Railroad
DOT	Department of Transportation
DPHS	Department of Homeland Security
EM	Emergency Manager/Emergency Management
EMS	Emergency Medical Service
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
GF&P	South Dakota Department of Game Fish and Parks
HAZMAT	Hazardous Material(s)
ICS	Incident Command System
LEPC	Local Emergency Planning Committee
MDU	Montana Dakota Utilities Company
MOA	Military Operating Area
NFIP	National Flood Insurance Program
NFIRA	National Flood Insurance Reform Act
NICC	National Interagency Coordination Center
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
NWS	National Weather Service
OEM	Office of Emergency Management
PDM	Pre-Disaster Mitigation
SCBA	Self-Contained Breathing Apparatus
SDCL	South Dakota Codified Law
SDDOT	South Dakota Department of Transportation
USDA	United States Department of Agriculture
USGS	United States Geological Survey

X. JURISDICTIONAL APPROVALS

BUTTE COUNTY RESOLUTION

BUTTE COUNTY
RESOLUTION 2011-12

The Butte County Board of Commissioners deems it advisable and in the best interest of Butte County to approve said Pre-Disaster Mitigation Plan.

PASSED AND APPROVED THIS 15TH DAY OF MARCH 2011.

BOARD OF BUTTE COUNTY
COMMISSIONERS

/s/: Steve Smeenk
STEVE SMEENK, CHAIRMAN

ATTEST: /s/: Elaine Jensen
ELAINE JENSEN
BUTTE COUNTY AUDITOR

BELLE FOURCHE CITY COUNCIL RESOLUTION

Prepared by: City of Belle Fourche
511 6th. Avenue
Belle Fourche, SD 57717

RESOLUTION
Resolution No. 3-2011

RESOLVED: the Belle Fourche City Council deems it advisable and in the best interest of the City of Belle Fourche to approve said Pre-Disaster Mitigation Plan.

PASSED AND APPROVED THIS 7TH. DAY OF MARCH, 2011.

Approved: Gary Hendrickson, Mayor

Attest: Sharon Mins, Finance Officer

NEWELL CITY COUNCIL RESOLUTION

RESOLUTION 02-2011

A RESOLUTION APPROVING A PRE-DISASTER MITIGATION PLAN

WHEREAS, the Butte county Pre-Disaster Mitigation Plan was developed to meet the requirements of the Disaster Mitigation Act of 2000 for the political subdivisions of the City of Newell and Butte county and;

WHEREAS, the original plan was written and approved in 2004, and is an update to the original plan. The purpose of the Pre-Disaster Mitigation Plan is to provide strategies and enumerate potential projects for mitigating or reducing the loss of life and property in the event of an emergency or disaster within the confines of Butte County and its political subdivisions.

NOW THEREFORE BE IT RESOLVED, the Commissioners of the Town of Newell, South Dakota, deems it advisable and in the best interest of the Town of Newell to approve said Pre-Disaster Mitigation Plan.

Dated this 21st day of March, 2011.

Mike Wolff, Mayor

ATTEST:

Jennifer Parrow, Finance Officer

(SEAL)

Passed & Adopted: March 21, 2011

Published: March 30, 2011

NISLAND COUNCIL RESOLUTION

Nisland Resolution

RESOLVED: the Nisland Town Council deems it advisable and in the best interest of the Town of Nisland to approve said Pre-Disaster Mitigation Plan.

Passed and approved this 10th day of March, 2011.

Jake Dell
Chairman, Nisland Town Council

ATTESTED: LeAnne H. Clark

VALE TOWNSHIP BOARD RESOLUTION

RESOLUTION

RESOLVED: The Vale Township Board deems it advisable and in the best interest of Vale Township to approve said Pre-Disaster Mitigation Plan.

PASSED AND APPROVED THIS 29 DAY OF March 2011.

Robert Roedy
Vale Township Board Chairman

ATTESTED: Colette Dunn
Vale Township Clerk

XI. APPENDICIES AND ATTACHMENTS

Appendix 1: Minutes from Public Meetings
- Vale
- Nisland
- Newell
- Belle Fourche

Appendix 2: Orman Dam Failure Inundation Maps
Appendix 3: Butte County Infrastructure Master List
Appendix 4: Butte County Community Wildfire Protection Plan
Appendix 5: FEMA Flood Insurance Rate Map for Belle Fourche
Appendix 6: Belle Fourche Subdivision Map
Appendix 7: Public Preparedness Materials
Appendix 8: Miscellaneous Documentation